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DISEASES CAUSED BY BACTERIA AND FUNGI.

BRYAN, C. S. (1934). **The Viability of Streptococci of Mastitis.**—*Vet. Med.* **29.** 524-526. [9 refs.]

Streptococci isolated from active cases of mastitis remained viable for 66 days in sand, eight days in soil, eight days in burlap sacking, 66 days in tap-water and eight days when a few drops were placed in sterile tubes. All materials were sterilized before use and heavily inoculated, sufficient tubes being prepared to permit daily examinations.

No significant difference was found between the results obtained when the inoculation was broth culture and those obtained when it consisted of washed bacteria ; nor was there any apparent difference in the viability of mastitis streptococci which produced α, β and γ colonies on blood agar.

Brucella abortus (porcine variety), tested similarly, remained viable for 120 days in sand, 46 days in soil, five days in burlap sacking, 77 days in tap-water and 121 days when allowed to dry in sterile tubes, these results being slightly longer than those obtained by CAMERON [this *Bull.* **3.** 468]. All tubes, etc., were kept at 22°C.—A. W. STABLEFORTH.

FAULDER, E. T., O'REAR, H. M., COTTON, C. E., & HISEL, C. C. (1933). **Report of the Special Committee on Tuberculosis.**—*J. Amer. vet. med. Ass.* **83.** 518-520.

This report contains statistics showing the steady progress made in the campaign against tuberculosis. The general incidence of the disease has been reduced from 4 per cent. to a little over 1 per cent.

Since the inception of the work in 1922, more than two and a half million cattle have reacted to the tuberculin test and have been slaughtered. An organized programme is now being followed in 11 states for the control and eradication of avian tuberculosis. With the gradual reduction of bovine and avian tuberculosis, there has been a corresponding decrease in the incidence of the disease in swine.

In 1923, 196,325 swine carcasses were condemned on account of tuberculosis, while in 1931 to 1932 the number was reduced to 38,305.—T. M. DOYLE.

CHRISTIANSEN, M. J. (1933). Danmark Bekendtgørelse af 28 Juli 1933 om Bekaempelse af Tuberculose hos Kvaeg og Svin og af Cirkulaere til samtlige

Dyrlaeger samt Regulativ for Udførelse af Tuberculinprøver paa Kvaeg og Svin samt for Udstedelse af Attested paa Grundlag af foretagne Tuberculinprøver. [**Denmark : Notice of 28th July, 1933 on Control of Tuberculosis in Cattle and Swine**].—*Skand. VetTidskr.* **23.** 456-464. [A long summary of this article appeared in *Dtsch. tierärztl. Wschr.* **42.** 34].

The more important points of the regulations for the control of tuberculosis and tuberculin testing are given. Free tuberculin is provided by the State for private testing of single herds, as well as for the collective testing of herds for Tuberculin Societies and dairies. Half the cost of the test will be refunded by the State to owners whose herds have not been tested during the previous five years and who have agreed to segregate all reactors for a period of at least two years. Half the cost of the test will be borne by the State in herds in which all cows have been once tested over a year previously and where the owner agrees to sell or segregate all reactors. The State will pay the full cost of the test in herds where no reactors are found or where all reactors have been immediately sold or isolated until disposed of. In herds where the State has paid in full for the first test, and the regulations as to disposal of reactors have been complied with, a free re-test will be made at the end of four months.

No fresh animals may be brought into contact with animals in a tuberculosis-free herd unless they are tested on the premises, or it can be certified that they come from a herd already free. Goats, sheep and swine may not come into contact with animals of a free herd unless they have passed the tuberculin test.

Dairies receiving milk from herds, 90 per cent. of which are tuberculosis-free, may apply to the State, if they so desire, for the remaining 10 per cent. of herds to be tested and tuberculosis to be eradicated. In such cases, half the cost of the test and compensation to the owners is borne by the State and half by the dairy.

In herds believed to be free from infection, the single intradermal tuberculin test is used, the measurements being made before, and 72 hours after, injection. All increases in measurement of 2·5 mm. or over are classed as positive. The use of an accurate caliper, graduated in half millimetres, is compulsory. Reactors must be retested intradermally with bovine and avian tuberculin, measurements being obtained after 24 and 48 hours. If the avian tuberculin reaction is the greater, the absence of bovine tuberculosis is assumed.

In all other herds, an increase in skin measurement of 3·5 mm. or more is classed as positive, and one between 1·5 and 3·5 mm. as suspicious. Such cases must be retested by "the double ophthalmic test" (bovine tuberculin) and by a subcutaneous test, using a double dose, at the time of the second ophthalmic dose. The temperature is taken at intervals of two hours, from the sixth to the 14th hour.

Slaughter is carried out in all cases of tuberculosis of the udder, uterus, in advanced cases of lung and bowel tuberculosis and in other cases of open tuberculosis. A whole herd may be slaughtered, including calves, where all animals have reacted to the tuberculin test, should the dairy taking the milk desire eradication. In such a case, full compensation is paid on the owner giving a written promise to disinfect his premises thoroughly and re-stock with tuberculosis-free animals.

Part compensation for slaughtered animals is given in other cases, ranging from Kr.30 to Kr.50, according to the class of animal slaughtered. The owner retains the skin and all meat fit for human consumption. The State pays for the transport to the abattoir and the cost of slaughter.—A. A. Forsyth.

Lurie, M. B. (1933). **Experimental Epidemiology of Tuberculosis. The Effect of a Primary Infection on Contact Tuberculosis in Rabbits.**—*J. exp. Med.* **58.** 305-327. 2 figs. on 1 plate, 3 tables. [22 refs.]

Taking advantage of the fact that contact tuberculosis occurs in normal rabbits exposed to cage mates infected with organisms of the bovine type, the author carried out experiments to determine if rabbits, vaccinated with living tubercle bacilli of the human type, were more resistant than normal rabbits to contact tuberculosis when exposed to cage mates infected with bacilli of the bovine type. The methods of accomplishing this work are described, and the result shows that vaccination reduced the incidence, extent and mortality of the disease, affected the route of infection, changed its pathological character and retarded its progress. The disease acquired by vaccinated rabbits shared many characteristics with the adult type of tuberculosis in man.—W. S. GORDON.

I. —. (1934). **Johne's Disease.**—*Aust. vet. J.* **10.** 67-68.
II. —. (1934). **Johne's Disease.**—*Ibid.* 41.

I. This is a report of a committee of veterinarians on Johne's disease in Victoria, where at least three properties have been found affected during the last ten years. It is considered that the appropriate authorities should immediately take steps to determine the incidence of the disease and prevent the introduction of infected animals. The insidious nature of the disease and the difficulties of controlling it are emphasized.

II. Attention is directed to the above mentioned report.—W. I. B. B.

NELSON, J. B. (1933). **Studies on the Uncomplicated Coryza of the Domestic Fowl. I. The Isolation of a Bacillus which Produces a Nasal Discharge.** —*J. exp. Med.* **58.** 289-295. [3 refs.]

The exudate from experimentally affected fowls was studied by ordinary bacteriological methods. Filtered exudate was found to be innocuous but, after cultivation in fluid horse blood at the bottom of agar slants, certain samples proved capable of setting up the disease. This was studied more fully and the results detailed. At first difficulty was experienced in detecting organisms microscopically, but later a small Gram-negative bacillus was regularly demonstrable. This organism would not grow on open plates, but grew well on blood agar plates tightly sealed and was capable of setting up the disease in healthy fowls, although the coryza did not last so long as that set up by injection of exudate. The symptoms are given in detail and the cultural characters of the organism are discussed without any definite classification being made.—J. E. WILSON.

NELSON, J. B. (1933). **Studies on an Uncomplicated Coryza of the Domestic Fowl. II. The Relation of the "Bacillary" Coryza to that Produced by Exudate.**—*J. exp. Med.* **58.** 297-304. 2 tables. [1 ref.]

Three types of coryza were studied, each having differences in the incubation period and duration of symptoms. Cross-protection tests were carried out with Types I and II using "bacillary" material and exudate, the results being tabulated.

In Type I there was evidence of reciprocal protection, but in Type II birds that had recovered from bacillary coryza were susceptible to injections of exudate although the incubation period was lengthened. The author tends to the view that this is not due to the presence of a second infective agent in the exudate, but rather to a reduction of the immunizing properties of the organism following artificial cultivation.

The author suggests that Type III is the basic form, the other two types being variants. The disease, whether induced by bacilli or exudate, could be transmitted to healthy fowls by direct contact.—J. E. WILSON.

ELIOT, Calista P., & LEWIS, Margaret R. (1934). **A Hemophilic Bacterium as a Cause of Infectious Coryza in the Fowl.**—*J. Amer. vet. med. Ass.* **84.** 878-888. 4 tables. [9 refs.]

A non-motile, non-indol-producing, Gram-negative haemophilic bacterium has been isolated from uncomplicated cases of infectious coryza of chickens. Pure cultures of the organism have been shown to produce coryza regularly in the chicken, when inoculated intranasally. It can be re-isolated from the infected bird and will again produce the typical clinical picture on inoculation into healthy non-carrier stock. It is proposed that the organism shall be called *Haemophilus gallinarum*. It shows the satellite phenomenon of *H. influenzae* of human origin in exhibiting better growth in the vicinity of contaminating cultures, but the actual details of the necessary growth factors responsible are meagre. [Whereas *H. influenzae* of human origin requires both " X " and " V " factors, the strains isolated from fowls by MCGAUGHEY – this *Bull.* **3.** 471. – required the " V " factor only, and it is hoped that further study of the organism along these lines will be carried out. For a description of the " X " and " V " factors see this *Bull.* **1.** 237].—R. LOVELL.

HENDRICKSON, J. M., & HILBERT, K. F. (1933). **A New and Serious Septicaemic Disease of Young Ducks with a Description of the Causative Organism Pfeifferella anatipestifer, n.s.**—*Rep. N.Y. St. vet. Coll. 1931-1932.* pp. 61-72.

The authors describe a new infectious disease of ducks with a rapid course and a very high mortality. Losses occurred chiefly in ducks three to ten weeks old, while the older breeding stock and ducklings under three weeks old were not affected. The symptoms observed were depression, profuse green diarrhoea, serous discharge from eyes and nose, followed by complete prostration and death in six to 12 hours after the onset of symptoms. The lesions found on autopsy were those of septicaemia with petechial haemorrhages on the mucous and serous membranes, gelatino-fibrinous exudate covering the liver and heart and mottled spleen. A slender, rod-shaped, Gram-negative organism was isolated with regularity from the heart blood, liver, spleen, kidneys and lungs of affected ducks. The organism is considered to be a new one and is tentatively classified as *Pf. anatipestifer*, and its morphology and cultural features are described in detail in the appendix. The organism is highly pathogenic to ducks when inoculated intravenously, but subcutaneous injections and feeding of the organism gave negative results. Chickens and rabbits are resistant to infection, while guinea pigs are resistant to subcutaneous inoculation, but die in a few hours following intraperitoneal inoculation. Experiments carried out in the course of one outbreak suggest that a vaccine of dead or attenuated cultures may be of value.—R. F. GORDON.

KOLAYLI, C., MAVRIDES, N., & ARAYEDJI, E. (1935). Durée de la virulence du sang dans le barbone. [**Duration of Virulence of Blood in " Barbone " – Haemorrhagic Septicaemia**].—*Rev. gén. Méd. vét.* **44.** 139-141.

Experiments carried out by the authors permit them to conclude that the blood of animals infected with " barbone " retains its vitality and virulence for 53 months when sealed in pipettes and kept at a temperature of 10°C.—G. O. D.

TULTSCHINSKAJA-TKATSCHENKO. (1934). **Vaccination against Fowl Cholera with Formalinized and Anilinized Vaccine.**—*Sovyet. Vet.* No. 10. pp. 46-48. [Abst. from abst. in *Tierärztl. Rdsch.* **40.** 858].

Broth cultures of *Pasteurella aviseptica*, killed by formalin (0·2 per cent.) or

crystal violet (1 : 5,000), were found to immunize fowls against experimental infection carried out two, four and six weeks later. Vaccines prepared with methylene blue (1 : 20,000) and malachite green (1 : 20,000) did not confer immunity.—J. E.

PEGREFFI, G. (1934). Avortement des brebis dû aux B. paratyphiques. [**Paratyphoid Abortion of Ewes**].—*Boll. Sez. ital. Soc. int. Microbiol.* **6.** 280-283. [In French].

This article refers to eight outbreaks of paratyphoid abortion of ewes in Italy. Generally, these commenced after the ewes had been three months advanced in pregnancy and 15 to 25 per cent. of the ewes aborted. The causal organism (cultural characters and sugar reactions given) was isolated from the heart blood, different exudates, bone-marrow and from the contents of the abomasum.

The organism was agglutinated by *Salmonella typhi* (formerly *Bact. typhosum* or *Eberthella typhi*) serum (titre 1 : 40,000) to a titre of 1 : 2,000, by *S. paratyphi* A serum (titre 1 : 2,000) to a titre of 1 : 1,000, and by *S. paratyphi* B serum (titre 1 : 2,000) to a titre of 1 : 500. The sera from a number of ewes which had aborted agglutinated the isolated strains to titres varying from 1 : 1,000 to 1 : 2,000 and they also agglutinated *S. typhi* to a titre of 1 : 20, *S. paratyphi* A to 1 : 160, *S. paratyphi* B to 1 : 40 and *S. enteritidis* (formerly *Bact. enteritidis* Gärtner) to 1 : 80. The same sera were negative to *Brucella abortus*, *Br. melitensis* and *Br. paramelitensis*. Sera from ewes which had not aborted agglutinated the isolated strains to titres of 1 : 40 to 1 : 80. A pathogenicity experiment was carried out. A pregnant ewe from a healthy flock aborted after subcutaneous inoculation with the isolated bacterium and the same organism was isolated from the foetus and placenta.

The author is of the opinion that the organism which he isolated and studied is a near relation to *S. paratyphi* A.—D. R. WILSON.

MORCOS, Z. (1935). **Pigeon Paratyphoid.**—*Vet. J.* **91.** 11-15. [7 refs.]

The author records the occurrence of serious outbreaks of paratyphoid disease in pigeons, caused by a small slender Gram-negative bacillus. The cultural and morphological characters of the organism are described, but no serological results are given, and the organism does not appear to have been definitely identified. Rabbits, rats and mice are susceptible to infection with this organism, while fowls, sparrows and guinea pigs are resistant. Vaccination was successfully carried out by two successive doses of killed cultures.—R. F. GORDON.

JUNGHERR, E., & WILCOX, K. S. (1934). **Salmonella aertrycke Variant as an Etiologic Agent of Paratyphoid in Pigeons.**—*J. infect. Dis.* **55.** 390-401. 4 tables. [36 refs.]

The authors investigated an outbreak of disease amongst pigeons in which about 15 per cent. of young birds died annually, diarrhoea being a common symptom. A severe infection with *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) had occurred in 1928. 375 breeding pigeons were subjected to the agglutination test using a *S.* (formerly *Bact.*) *pullorum* antigen, and nine positive and 12 suspicious reactors were found. A paratyphoid-like organism was isolated from the affected recently hatched birds, many of which also suffered from trichomoniasis and strongylosis. Using this organism as an antigen, the sera of 550 breeding pigeons were tested and 56 positive and 97 suspicious reactors found.

The methods of typing the organism are detailed and the author concludes that it was an atypical variant of *S. typhi-murium*.

The agglutination test was not found to be a satisfactory method of detecting carriers.—J. E. WILSON.

KHALIFA, I. A. B. (1935). **Serological Study of Pigeon Paratyphoid in Egypt.**—*J. Amer. vet. med. Ass.* **86.** 24-27. 2 tables.

The article records briefly the cultural and biochemical reactions, the pathogenicity for some of the laboratory animals, and the serological relationship to the other members of the salmonella group, of an organism isolated during an epizootic of paratyphoid disease in pigeons. Direct agglutination test and absorption tests with other known members of the salmonella group showed the organism to be identical with *Salmonella typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau).—R. F. GORDON.

NOTTER, J. (1934). Abortuskommission der Gesellschaft Schweizer. Tierärzte. **[Meeting of the Abortion Commission of the Swiss Veterinary Society].**—*Schweiz. Arch. Tierheilk.* **76.** 645-647.

This article reviews the educational and investigational work done by the above body. It emphasizes the necessity of educating farmers upon abortion control and the importance of control methods in the summer on common pastures. All the known methods of controlling the disease are discussed and a report given upon the results. Segregation is considered the best method to adopt, but farms must be treated individually. In certain cases vaccination with an avirulent, long tested culture of *Brucella abortus* may be desirable.—K. D. DOWNHAM.

THOMPSON, R. (1934). **The Distribution of Brucella abortus in the Infected Udder.**—*Canad. publ. Hlth J.* **25.** 229-233. 2 tables. [12 refs.]

The author studied the distribution of *Br. abortus* in the udder, and found that there was a greater tendency for the organisms to localize in the right hind than in the other quarters. He considers that *Br. abortus* is absent from udders clinically affected with mastitis.—T. M. DOYLE.

KING, R. O. C. (1934). **Brucella Abortion Infection in Swine in New South Wales.**—*Aust. vet. J.* **10.** 93-100. 4 tables. [4 refs.]

Infection of swine in New South Wales with the porcine strain of *Br. abortus* is recorded for the first time. A small number of pigs reacted positively to the agglutination test using antigens prepared from bovine and from porcine strains of brucella. Full details of these agglutination tests are given. A strain of brucella was isolated from the vaginal exudate of a positively reacting sow which had recently aborted. The identification of this strain was established by an exhaustive study which included guinea pig inoculation, serological tests, biochemical tests and growth on dye media. It conformed to all the requirements for the porcine strain of *Br. abortus.* Nine strains of brucella of bovine origin were also subjected to these tests and conformed to the requirements for *Br. abortus.*—W. I. B. B.

CREECH, G. T. (1935). **Organic Lesions in Swine Caused by Brucella suis.**—*J. Amer. vet. med. Ass.* **86.** 211-216. 5 figs. [6 refs.]

The porcine type of *Br. abortus* has been associated with lesions in the vertebrae and joints of infected pigs. Whilst certain American workers have recorded its isolation from various organs, histological studies were not made and macroscopic lesions were not observed. Creech describes one case, where yellowish, necrotic nodular lesions were present in the kidney, liver and lymph node tissue. Cultural examination revealed a pure growth of the organism from the kidney and liver

lesions. The organism was recovered from nodular lesions in inoculated guinea pigs.—A. L. MULLEN.

MESSER, A. I. (1934). **Undulant Fever and Contagious Abortion in Northumberland.**—*Brit. med. J.* Nov. 10th. 856-858. 1 table. [9 refs.]

The sera of 425 patients were examined for *Brucella abortus* agglutinins and 16 (3·7 per cent.) were found to be positive with titres ranging from 1 : 125 to 1 : 3,000. On clinical data these cases could be divided into two groups. In six the chief symptoms were headache, fatigue, loss of appetite, weakness and sweating, especially at night. Although mild, several of these cases ran a prolonged course. The remaining cases constituted a heterogeneous group in which the illness was of a more acute nature with a very varied symptomatology. Details of three cases are given, two occurring in persons in agricultural occupations.—S. J. EDWARDS.

BOAK, R. A., & CARPENTER, C. M. (1934). **Brucella melitensis Infection in Cattle.**—[Copied *verbatim* from *J. Bact.* **27.** 73].

We previously reported the results of a survey of *Brucella abortus* infection in raw milk from 3 counties in central New York. Of 122 samples 20·4 per cent. showed by guinea pig injection evidence of the infection. Three of the cultures proved to be *Br. melitensis* upon further serological and biochemical examinations and by monkey inoculation. These cultures were isolated from samples of milk collected from herds in 3 rather widely separated towns in the area surveyed. Possible contact with goats was determined in 2 instances. Experimental data on the injection of cattle with cultures of *Br. melitensis* are submitted showing their relative resistance to the strains used. A brief history of this infection in cattle in the United States is given.

BER, A. (1934). Patogeneza choroby banga u malych gryzoniów laboratoryjnych. [**Pathogenesis of *Br. abortus* in Laboratory Animals**].—*Rozprawy Biol.* **12.** 89-126. 3 tables. [9 refs.] [Abst. from French summary].

A detailed account of the pathogenesis of *Br. abortus* when inoculated intraperitoneally into rats, mice and guinea pigs. If the dose is large these animals die of a septicaemia as early as 24 hours or as late as 15 days after infection. Animals infected in small doses develop lesions in the internal organs but the lesions may become encapsulated and not cause death.—J. E.

DI AICHELBURG, U. (1935). Fermentation des hydrates de carbone par les germes du type Brucella. [**Fermentation of Carbohydrates by Brucella**].—*Boll. Sez. ital. Soc. int. Microbiol.* **7.** 17-22. 1 table. [19 refs.] [In French].

The author studied the capacity of 36 strains of brucella, originating from animals and man, to ferment carbohydrates. He found that brucella attack monosaccharides except mannose. There was no appreciable difference in the utilization of glucose between strains of different origin.—T. M. DOYLE.

DÉBONERA, G. (1934). Contribution à l'étude de la dysentérie des agneaux. [**Lamb Dysentery (Greece)**].—*Rec. Méd. vét.* **110.** 524-534. 1 fig. [14 refs.]

The author discusses lamb dysentery as it occurs in Greece, and forms the opinion that the disease in that country differs in no way from that which occurs in Britain. He describes the symptoms shown by affected lambs and the lesions which he found on *post-mortem* examination. A considerable part of the article relates to cultural characters of the causative organism and pathogenicity experi-

ments which he carried out on small laboratory animals. Records of neutralization tests in guinea pigs are also given. Whole culture, toxin and bacterial suspensions were tested against *Clostridium welchii* type A antiserum and whole culture was tested against a homologous serum. In distinction from the homologous serum, it was found that type A antiserum had no neutralizing value and, in this respect, the organism was found to be identical with the lamb dysentery bacillus (Dalling).
—D. R. WILSON.

STYLIANOPOULOS, M. (1934). Sur l'existence de la dysentérie des agneaux en Grèce et contribution à son étude. [**Lamb Dysentery in Greece**].—*Ann. Méd. vét.* **79.** 418-427. [9 refs.]

This disease has been intensively studied in Greece only during the last two years, so that its prevalence and distribution are not yet definitely known, but it seems to be on the increase. The symptoms, lesions and bacteriological findings described appear to be identical with those found in lamb dysentery in Great Britain.

Cases of lamb dysentery are much rarer in the autumn lambing than in the spring lambing.

The author was able to set up cases of the disease experimentally by feeding with faeces from infected lambs and with cultures of the lamb dysentery organism. He also produced a haemorrhagic enteritis, sometimes with ulceration, in newly-born guinea pigs by feeding them with cultures of this organism.—A. BROWNLEE.

MESSING, W. A. (1934). **The Mechanism of Bacterial Anaerobiosis. III. The Oxidation-Reduction Potential of the Butyric Bacillus in Presence of Sulphydryl Compounds.**—*Bio-chem. J.* **28.** 1894-1900. 3 figs., 1 table. [18 refs.]

Experiments have been carried out on the growth of anaerobes (*Bacillus saccharobutylicus*, anaerobic strain) on peptone media with or without the addition of sulphydryl compounds (glutathione, cysteine) or glucose. It is confirmed that sulphydryl compounds promote the growth of anaerobic bacteria either anaerobically or aerobically. The reduction potential of the medium was followed electrically, and it is shown that the growth of the bacteria is accompanied by a drop of the potential. It is thought that this growth is probably not due to the establishment of a negative reduction potential, for it begins when the potential is still positive. In sugar-containing medium the potential, after a fall, returns to a positive level and, as growth still continues, the author considers that this finding supports his views. The drop of potential is thought to be due to some interaction which takes place between the bacteria and the medium in the course of the metabolic processes going on in the cell. It is suggested that sulphydryl compounds exert their effect through some "peculiar activating effect upon the interaction between the organisms and the medium."—W. R. WOOLDRIDGE.

KAGAN, F. I., KAVALENKO, J. R., & MAKAROVA, E. P. (1934). **The Preparation of Monovalent and Polyvalent Antisera for Anaerobic Infections.**—*Sovyet. Vet.* No. 11. pp. 18-21. 2 tables. [Abst. from French summary].

The authors, of the Central Control Laboratory, when using cattle (better than horses) obtained an active anti-*Clostridium chauvoei* serum in one and a half to two months, using first formalin-killed cultures and then living cultures.

Active polyvalent serum against *Cl. chauvoei* and the group of malignant oedema bacteria can be obtained in an animal under prolonged treatment (at least five and a half months).—C. V. WATKINS.

PELLIZZARI, R. (1933). Ricerche batteriologiche sull'utero e sulle ovaie delle vitelle lattanti. [**Bacteriological Examination of the Uterus and Ovary of Suckling Calves**].—*Ist. Zooprofil. Tre Venezie, Padua. Spec. Publ.* pp. 12. 1 table. [13 refs.]

The author examined the genital organs of 50 female calves. Only in a few cases did the ovaries appear similar to the description given in the text-books. The majority were extremely lobulated and histological examination showed that the lobulations were due to Graafian follicles in various stages of development and degeneration. In three animals, yellowish black spots due to coagulated blood were seen at the periphery of the ovarian stroma. The majority of the uteri appeared normal ; in a few cases much mucus was present in the uterine horns and body, in other cases haemorrhages on the uterine mucous membrane were seen and in one case pus was present. On bacteriological examination, bacilli of various types were isolated not only from those organs which appeared abnormal but also from some which appeared normal. The organisms proved to be chiefly *Bact. coli*, staphylococci and diplococci.—J. A. NICHOLSON.

THOMPSON, L. (1933). **The Systematic Relationships of Actinobacillus.**—*J. Bact.* **26.** 221-227. 2 tables. [12 refs.]

The author claims that the close morphological, cultural and serological relationship which exists between *Actinobacillus lignieresi*, *Pfeifferella mallei* and *Pf. whitmori* (*Flavobacterium pseudomallei* in Bergey's classification) justifies the inclusion of all three in the same genus. He considers that this genus should be known as *Actinobacillus* Brumpt, since this name has priority over *Pfeifferella* proposed by BUCHANAN. It is also suggested that the newly revised genus *Actinobacillus* should be included in the family Mycobacteriaceae in the position at present occupied by *Pfeifferella*, as this genus has little in common with the Actinomycetaceae. The species would thus be *A. lignieresi*, *A. mallei* and *A. pseudomallei*.
—GWILYM O. DAVIES.

GRAY, J. D. A. (1935). **An Aerobic Acid-Fast** *Actinomyces* **in Cow's Milk Due to an Udder Infection.**—*J. Dairy Res.* **6.** 49-55. 3 figs. [15 refs.]

From the milk of a fore quarter of an imported Guernsey cow there was obtained a filamentous organism which exhibited dichotomous branching, was almost invariably Gram-positive and was not decolorized by 1 per cent. sulphuric acid. Clubs were not observed in animal lesions. The organism was a strict aerobe and grew well on ordinary media at temperatures between 23° and 40°C. In guinea pigs, subcutaneous inoculation produced a local abscess, whilst intraperitoneal and intravenous inoculations were fatal in one to three weeks, miliary nodules being present on the serous membranes. Intravenous inoculation of rabbits provoked a fatal septicaemia in two days, miliary lesions being found in the internal organs. A similar organism was recovered from a suspension from the amputated quarter which itself showed abscess formation and slight fibrosis.—J. W. EMSLIE.

JUNGHERR, E. (1935). **Mycotic Affections of the Bovine Reproductive System.**—*J. Amer. vet. med. Ass.* **86.** 64-75. 9 figs., 1 table. [14 refs.]

The author considers that many cases of " sporadic abortion " in herds free from *Br. abortus* infection are due to mycotic affections of the pregnant uterus. In this paper he gives details of four such cases and prefaces his account with a brief survey of instances previously recorded by other authors.

All four cases occurred in Holstein cattle between four and ten years of age. Case (1) was destroyed owing to sterility following abortion. The presence of

mycosis was demonstrated by histological examination of the placenta. In case (2), *Aspergillus fumigatus* was isolated from the amnion and in case (3) *A. fumigatus*, *A. niger*, and *Rhizopus cohnii* from the placenta. In case (4) evidence was obtained at two abortions ; in the first instance by histological examination of the placenta and in the second instance by the isolation of *Mucor pusillus* from the placenta.

Such forms of abortion are only of slight importance from the epizootic standpoint and, in the main, concern only the sexual health of the affected animal.

—GWILYM O. DAVIES.

FERET, O. R. (1934). La microsporie du chat et sa transmission à l'homme. [**Microsporon Ringworm in the Cat and its Transmission to Man**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 55. [45 refs.]

This thesis records five cases of ringworm in the human subject due to *Microsporon felineum*. It appears to be not uncommon in France, particularly in children who become infected from Persian kittens. In cats the lesions are usually to be found around the mouth and eyes, behind the ears and on the flanks. Cultures present a variable appearance according to the medium used. Hairs when examined microscopically show a similar type of lesion to that caused by *M. audouini*, except that the microsporon sheath is particularly thick.—GWILYM O. DAVIES.

SHAW, F. W. (1934). **An Abridged Key to the Genera of Pathogenic Fungi.**—*J. Lab. clin. Med.* **20.** 113-127. 42 figs.

This key cannot be abstracted and should be consulted in its original form.

It is intended for the use of clinical pathologists and the aim has been utility rather than a natural system of classification. Forty-six genera, including most pathogens and the majority of non-pathogens encountered by the medical bacteriologist, have been placed in the groups *Dermatophyta*, *Genera Dubia* and *Genera Certa*. Illustrations accompany the descriptions of most of the genera.—G. O. D.

DISEASES CAUSED BY PROTOZOAN PARASITES.

HORNBY, H. E., & BAILEY, H. W. (1934). **Trypanosomiasis Research.**—*Rep. Dep. vet. Sci. Tanganyika, 1933.* pp. 19-34. 5 tables.

This report is divided into three parts :–

(1) TRANSMISSION.—A description is given of the climatic and vegetative conditions which have permitted tsetse flies to form a permanent habitat twenty miles east of Mpwapwa laboratory. On the other hand, the prevailing vegetation around Mpwapwa itself is deciduous scrub which can harbour tsetse only while in leaf. Seasonal invasion of this scrub by *Glossina pallidipes* may be effected by flies from the strips of riverine forest which link the dry bush with the moister fly-belt. A description is given of measures to clear portions of the riverine strips and thus break the connection. If, as a result, there be an equal reduction in numbers of both tsetse and cases of trypanosomiasis, then it is probable that most of the numerous cases which, in previous years, have been attributed to mechanical infection were really due to undetected glossina.

(2) PATHOLOGY.—As further evidence that *Tryp. congolense* is essentially a blood parasite, it is pointed out that in sections of lymph glands of guinea pigs it was easy to demonstrate the parasites in blood-vessels, but none were seen in the lymph channel. It is contended that the *T. congolense* found in gland smears have come from punctured blood-vessels of small calibre within or around the gland.

It is pointed out that a smaller number of *T. congolense* will infect an ox or

goat if given directly into the true habitat, i.e. the blood stream, than if given subcutaneously. For example, 7,500 of these trypanosomes, given intravenously, infected a goat, whereas 15,000 failed to infect when given under the skin.

An examination of the blood of cattle infected with *T. congolense* showed no increase in reticulocytes during any stage of the disease. This is considered to indicate that the type of anaemia is myelogenous rather than haematogenous.

(3) TREATMENT.—Experiments with a new drug, " surfen C ", gave good results, a single intramuscular injection being as effective as a course of " antimosan" or tartar emetic injections.

A tabulated description is given of 100 cases of uncomplicated *T. congolense* infection of bovines treated by antimonials alone. Each case was under close observation until death or recovery. The definition of recovery is :– the animal must have been apparently free from trypanosomes for not less than six months ; must present a normal, healthy appearance ; must be holding its own weight or gaining in weight, according to season, the same as a normal healthy control ; must not be anaemic, as judged by the Tallqvist haemaglobinometer. Sixty-five animals recovered, of which 46 (71 per cent.) were cured by a single course of treatment. " Antimosan " gave definitely better results than tartar emetic.—S. A. E.

METTAM, R. W. M. (1934). **Trypanosomiasis Research.**—*Rep. vet. Dep. Uganda, 1933.* pp. 34-40. 2 tables.

During the year under review, experiments were carried out on the pathogenicity of *Tryp. rhodesiense* and *T. brucei* for domestic stock. Nine out of 12 cattle died from infection with *T. rhodesiense*. The average duration of the disease in fatal cases was 129·2 days, but trypanosomes could rarely be found in the blood after two months, though, in one case, the blood proved infective 366 days after the initial inoculation. Sheep and goats succumbed to *T. rhodesiense* in 43 to 46 days. A strain of *T. brucei* from a *Glossina morsitans* area proved highly pathogenic to cattle, causing death in 45 days.

TRANSMISSION EXPERIMENTS.—Successful transmission of *T. congolense* from ox to ox, by the interrupted feeding of both *Tabanus thoracinus* and *Stomoxys calcitrans*, the intervals being a matter of seconds, is recorded, whilst attempts to transmit with *Rhipicephalus appendiculatus* and *Linognathus vituli* (cattle lice) were unsuccessful. The administration of infected blood *per os* only caused infection in cattle after scarification of the buccal mucous membrane. Experiments on the trypanosome infection of game have been continued, and it is recorded that, judged by the results of subinoculation, they are capable of complete recovery.

CHEMOTHERAPY.—The failure of " naganol " to cure *T. brucei* infections in calves and goats is recorded, though consistently satisfactory results were obtained in cats and dogs.

With regard to the treatment of *T. congolense* in cattle it is stated :–

" Further experimental evidence shows that antimosan is the most satisfactory drug available for the treatment of *T. congolense*. It is best given in full doses (40 cc.) daily for four consecutive days. There is both experimental and field proof that this method is superior to the four doses given weekly for four weeks. Nevertheless a large number, probably more than half the animals treated, relapse and a second course of treatment is required."

This is a very serious disadvantage which, coupled with the expense of the drug, makes " antimosan " therapy on a large scale impracticable, so that in large outbreaks of trypanosomiasis due to *T. congolense* it is necessary to rely on potassium antimony tartrate.

A strain of *T. congolense* which resists tartar emetic to an unusual degree, and which requires unusually large doses of " antimosan " is under observation.

Fowls were found to be resistant to *T. congolense*.

TRYPANOSOMIASIS OF SWINE.—Pigs were infected experimentally with *T. brucei*, *T. rhodesiense*, *T. congolense* and *T. uniforme*. The first two infections have proved fatal, whilst the latter two are still under observation.—U. F. R.

KRIJGSMAN, B. J. (1933). Biologische Untersuchungen über das System: Wirtstier-Parasit. I. und II. Teil: Die Entwicklung von Trypanosoma evansi in Maus und Ratte. III. Teil: Das Verhalten der Blutproteine und IV. Teil: Das Verhalten des Blutzuckers während der Entwicklung von Trypanosoma evansi in der Ratte. V. Teil: Das Verhalten des Milchsäurespiegels, der Alkalireserve, der Wasserstoffionenkonzentration sowie des Cystinspiegels des Wirtstierblutes während der Entwicklung von Trypanosoma evansi in der Ratte. [**Biology of the Host-Parasite System. I. & II. The Development of *T. evansi* in the Mouse and Rat. III. & IV. The Behaviour of the Blood Proteins and Blood Sugar during the Development of *T. evansi* in the Rat. V. The Behaviour of Lactic Acid, Alkali Reserve, Hydrogen-Ion Concentration and Cystine of Rat Blood during the Development of *T. evansi***].—*Z. Parasitenk.* **5.** 592-678 and **6.** 1-22 and 438-477. 1 fig., 93 tables, 22 graphs. [214 refs.]

In the experiments recorded in these papers, every effort was made to render conditions uniform by the employment of experimental animals of similar breeding, fed on standard rations, and of trypanosome strains derived from single individual parasites. The hosts were inoculated with definite doses of trypanosomes, and the course of the infection was judged by estimating the number of trypanosomes and the percentages of the various developmental forms.

In mice, the infection exhibited a progressive rhythmical increase, with stages of slow and rapid multiplication, the trypanosomes being present in the blood from the time of inoculation to death. The rhythmic nature of the increase in parasites is due to a factor which retards multiplication. The cycle of the infection is independent of the method of inoculation or the dose of trypanosomes, except that very large doses disturbed the course of the infection, but the duration of the disease varies with the dose of trypanosomes injected. Shortly before the death of the mice a factor appears which causes the destruction of trypanosomes, but is too feeble to produce a marked effect. During the whole duration of the infection, trypanosomes devoid of blepharoplasts are present in small and irregular numbers, and their significance is doubtful, but the prevalence of granules appears to be connected with a retarding of the multiplication rate.

In rats, the cycle of development might follow the same type as the mouse, or there might be a type with more prolonged periods of slow multiplication. The factor causing a destruction of trypanosomes appeared earlier than in the mouse and was more effective, so that actual decreases of organisms in the blood may occur, followed by a new increase. Various types of infection exist between the intermittent type and that of rhythmic progression. In the rat, no marked decrease of blood protein occurred with the development of the trypanosome infection, nor did the blood protein concentration appear to be in any way connected with the periods of retardation of the trypanosome cycle. The observation that there is a drop in the blood sugar content immediately prior to death was confirmed, but retardation of multiplication cannot be ascribed to lack of sugar, as any sugar used by the trypanosomes is quickly replaced by the liver. During the rhythmic progressive increase of trypanosomes, there is a rise in the lactic acid content of the blood and, at the death of the rat, this may exceed 100 mg. per 100 c.c., but the inoculation of additional lactic acid did not influence the trypanosome cycle,

so that the lactic acid concentration does not appear to be related to the factor causing trypanosome destruction. Shortly before the death of the rats there is an exhaustion of the alkali reserve with a decrease of the pH of the blood. No connection could be established between the blood cystine concentration and the trypanosome infection.

A decrease in the number of erythrocytes was recorded early in the trypanosome infection, and this persisted throughout the course of the disease. The injection of insulin or adrenaline was not found to influence the development of the trypanosome cycle, but insulin and a combination of adrenaline and glucose were found to prolong the lives of the experimental animals.—U. F. RICHARDSON.

BARDEZ. (1934). Contribution á l'étude de la trypanosomiase équine et bovine au Cameroun. **[Equine and Bovine Trypanosomiasis in the Cameroons].** —*Rev. vét. milit.* **18.** 457-467.

This article gives a general account of the problems of animal trypanosomiasis in the Cameroons without detailing the species of trypanosomes which may be encountered. The most interesting observation is that, in horses, an acute relapse to disease can be provoked in carrier animals by bleeding ; the removal of 1·5 litres of blood is sufficient to produce a disease crisis, associated with oedema of the sheath, a staggering gait and a febrile reaction with the appearance of trypanosomes in the peripheral blood. For treatment, tartar emetic injections every third day, combined with " atoxyl " injections every tenth day are recommended.—U. F. R.

REINER, L., & SMYTHE, C. V. (1934). **Glucose Metabolism of the Trypanosoma Equiperdum in Vitro.**—*Proc. Soc. exp. Biol. N.Y.* **31.** 1086-1088. [13 refs.]

This paper records attempts to estimate the glucose and oxygen consumed by *T. equiperdum in vitro*, and the products formed under both aerobic and anaerobic conditions. The authors suggest that glucose is converted to glycerol and pyruvic acid and that, in the presence of oxygen, the glycerol is also converted to pyruvic acid. The paper is very technical and should be consulted in the original.—U. F. RICHARDSON.

HORNBY, H. E., EVANS, S. A., & CORNELL, R. L. (1934). **Pathogenicity of** *Trypanosoma theileri.—Ann. Rep. Dept. Vet. Sci. & Anim. Husb., Tanganyika, 1933.* pp. 34-36.

There is a short reference to the wide distribution of this parasite and to the relevant literature ; particulars of its pathogenicity complicating routine rinderpest serum production and experimental data are given. The results are summarized as follows :–

T. theileri is non-pathogenic in that infection of a healthy ox with this parasite usually leads without symptoms to an easily acquired immunity. In most parts of Tanganyika Territory this immunity is acquired at an early age by practically all cattle. There are areas, however, where the infection is rare or non-existent.

If initial infection with *T. theileri* be acquired synchronously with rinderpest, fatal trypanosomiasis is likely to be set up. The possibility of this must be borne in mind wherever rinderpest inoculations are practised. Untoward results may be avoided by either (a) first immunizing the cattle against *T. theileri*, (b) giving the cattle a preliminary protective dose of rinderpest vaccine, (c) using rinderpest virus from a goat, or (d) giving rinderpest by nasal swabbing instead of by injection.

—S. A. EVANS.

PENSO, G. (1934). Sul ciclo di sviluppo del " Trypanosoma gambiense " negli ospiti vertebrati. [**Developmental Cycle of** *Tryp. gambiense* **in the Vertebrate Host**].—*Ann. Med. nav. colon.* **40.** 25-77. 6 text figs., 43 figs. on 11 plates, 3 tables. [54 refs.] [Abst. from abst. in *Trop. Dis. Bull.* **31.** 589-590].

The author considers that there are obscurities in our knowledge of the development of trypanosomes in the vertebrate hosts, and interprets the " anomalous " forms as stages in the cycle of development and not as degenerative forms.

For his investigations he employed guinea pigs, rabbits and white rats, and inoculated them intraperitoneally, and later intravenously, with a strain of *T. gambiense*. The development stages were studied in smears of the peripheral blood and various organs, and by histological examination of tissues fixed in Schaudinn's or Bouin's fluid.

The author states that the trypanosomes undergo morphological alterations occurring in definite sequence and repeatable experimentally. He describes two types of organisms which differ in that the nucleus of one is spherical with large chromatin granules, while the nucleus of the other is elongated. He regards these as sexual forms and the unions of the two, which are sometimes encountered, not as dividing forms but as copulation. Then follow stages of endotrypanum, crithidia, leptomonad and leishmania forms. Soon after the disappearance of the parasites from the circulation – the so-called " trypanolytic crisis " – small leishmania forms occur in the bone-marrow and elsewhere ; these increase in size and become post-leishmania forms which develop into a tadpole form by the drawing out of the anterior protoplasm into a fine undulating membrane. Lastly, by the migration of the blepharoplast to a posterior position, the pre-trypanosome form is produced, becoming a typical trypanosome by more marked development of the flagellum and the undulating membrane.—U. F. RICHARDSON.

VALENZA, J. (1935). Maladies expérimentales de réinfection. [**Reinfection Experiments (Trypanosome Infections)**].—*Arch. Inst. Pasteur Tunis.* **24.** 92-98. [3 refs.]

This article records the results of reinfecting guinea pigs which had been cured of *Tryp. congolense* infection by treatment with " moranyl," " moranyl " and " tryparsamide ", or " moranyl " and antimony sodium thiomalate. Only one guinea pig out of three was successfully cured with " moranyl " alone and this animal resisted a first, but succumbed to a second reinfection. [There may be some doubt in this case as to whether recovery was due to the drug treatment].

Animals cured by the combined methods of treatment failed, as a rule, to resist reinfection, but the second infection exhibited a prolonged incubation period and an abnormally chronic course, and in one case the fact of reinfection could only be demonstrated by subinoculation as no trypanosomes were detected in the blood.—U. F. RICHARDSON.

BOS, A. (1934). Over trichomoniasis bij duiven. V. Mond- en keeltrichomoniasis (flagellatendiphtherie). [**Trichomoniasis of the Mouth and Keel (Sternum) of Pigeons**].—*Tijdschr. Diergeneesk.* **61.** 1125-1139. 4 figs. on 1 plate. [13 refs.] [English, French and German summaries : abst. from orig.]

A description of a disease in pigeons characterized by the presence of fibrinous necrotic inflammation of the mouth, throat, larynx and anterior oesophagus and trachea. Trichomonads were cultivated from lesions and reproduced the condition in healthy birds both in the mouth and on the scarified skin. The absence of fowl pox was verified.

The disease was also transmitted successfully to turkeys. This disease is said to be more common in pigeons than pigeon pox.—J. E.

JOHNSON, W. T. (1934). **Chronic Avian Coccidiosis.**—*J. Parasit.* **20.** 330-331.

In experiments pertaining to immunity, evidence of chronic infection was obtained incidental to other data. Five "immunized" fowls were given large doses of *Eimeria praecox*, *E. mitis*, *E. acervulina* and *E. tenella* on March 18th, April 13th, May 4th and June 2nd respectively. One bird died on July 24th from chronic infection with *E. mitis* administered on April 13th. There was evidence of chronic infection with *E. mitis*, *E. acervulina* and *E. praecox* in other fowls.
—U. F. RICHARDSON.

BRUN, M. (1934). Contribution à l'étude du traitement et de la prophylaxie des piroplasmoses algériennes. [**Contribution to the Study of the Treatment and Prophylaxis of the Algerian Piroplasmoses**].—*Thesis for Docteur vétérinaire, Lyons.* pp. 84. 1 table. [63 refs.]

This paper reviews the present state of knowledge regarding diseases due to piroplasms as they occur in Algeria. It contains no new matter. Part I deals briefly with the classification of the parasites of this sub-order and their incidence in that country. Part II is devoted to therapeutic measures. Trypan blue, piro blue, "ichthargan" – a combination of silver and "ichthyol" – and "gonacrine" – a derivative of acridin – are particularly favoured, and receive special attention. The salts of quinine antimosan, and "atoxyl" and tamarisk root are then briefly considered.

Part III deals with prophylaxis. The author considers that the vaccine method of the Pasteur Institute of Algeria provides a certain and safe means of protective inoculation. This is based upon the use of citrated virulent blood taken from an affected animal between three and eight months after the first paroxysm of fever. Introduction into the inoculated animal is by the subcutaneous conjunctival route. The use of such vaccines in *Babesia bigemina*, *Theileria dispar* and *Anaplasma marginale* infections is described. The author designates the form of protection so conferred as "premunition", in that it is by nature a tolerance to a mild chronic infection rather than a true resistance to disease.—C. DAVENPORT.

DONATIEN, A., & LESTOQUARD, F. (1934). Traitement curatif de la piroplasmose de la poule à *Aegyptianella pullorum*. [**Curative Treatment for** *Aegyptianella pullorum* **Infection in the Fowl**].—*Bull. Soc. Path. exot.* **27.** 647-649. [1 ref.]

The authors discuss an outbreak of disease amongst pullets in Algeria due to *A. pullorum*. Good results followed the administration of "stovarsol" but a later experiment did not confirm this. It is suggested that this drug may be useful as a tonic in cases of anaemia. The effect of intravenous injections of "gonacrine", trypan blue and "ichthargan" on three affected pullets was studied; the latter alone proved efficacious and that only after a second injection.—J. E. WILSON.

SERGENT, Ed., DONATIEN, A., PARROT, L., & LESTOQUARD, F. (1933). L'anaplasmose bovine à *Anaplasma centrale*. [**Bovine Anaplasmosis due to** *Anaplasma centrale*].—*Arch. Inst. Pasteur, Algér.* **11.** 526-569. 1 graph. [8 refs.]

This article records experiments on the cross-immunity conferred by a strain of *A. centrale* against infections with strains of *A. marginale* from Algiers and Brazil. The *A. centrale* strain was obtained from Kenya by the despatch of specimens of citrated and defibrinated blood on ice. The journey took three weeks, and, on arrival, the inoculation of defibrinated blood conveyed infections of *A. centrale* and *Theileria mutans*, whilst the citrated blood was non-infective.

Pure infections of *A. centrale* were obtained in 24 calves, of which only eight

showed any febrile reaction. The incubation period of the thermal reaction varied between 16 to 45 days ; parasites appeared in from 16 to 66 days, and persisted for 12 to 57 days, the mean infection rate being 109 parasites per 1,000 red corpuscles ; usually there was only a single infection of individual corpuscles. The blood of an infected animal proved infective up to two years after inoculation. In *A. centrale* infections, $^{9}/_{10}$ of the parasites adopt a central position in the corpuscle and $^{1}/_{10}$ a peripheral position, whilst, in *A. marginale* infection, ⅕ are central and ⅘ peripheral. *A. centrale* infection produced no symptoms in the experimental animals, but examination of the blood revealed a marked anisocytosis.

A previous infection with *A. centrale* protected against a second inoculation with the same organisms, but did not protect against an Algerian strain of *A. marginale*, as evidenced by the resulting severe febrile reactions, and the high rate of parasitized corpuscles.

Previous infection with *A. marginale* strains from Algiers or Brazil gave sufficient protection against either the homogeneous or heterogenous strain to prevent any severe reaction in the experimental cattle, though a mild parasitic invasion usually resulted. Neither of the strains of *A. marginale* conferred any immunity against subsequent infection with the *A. centrale* strain.

The authors conclude that *A. centrale* represents a distinct microbian species characterized by the central position of the parasite in the corpuscle, and by the mildness of the resulting infection ; they also conclude that *A. marginale* of Algiers and *A. marginale* of Brazil belong to one and the same species.—U. F. Richardson.

Carré, H., & Farbos, J. (1935). Un foyer d'anaplasmose du mouton dans la région des Landes. [**A Centre of Ovine Anaplasmosis in Landes, France**]. —*C. R. Soc. Biol. Paris.* **118.** 754-755.

The authors record the detection of *Theileria recondita* associated with a disease of sheep in the west of France. The disease is characterized by symptoms of pulmonary emphysema, the autopsy revealing an infection with a large variety of helminths, and an enlargement of the spleen. Subinoculation of blood, from the animal revealing the *Th. recondita* infection, produced an intense anaemia and the appearance of *Anaplasma ovis* in two lambs and a ewe.—U. F. Richardson.

Nigg, Clara. (1935). **On the Preservation of Typhus Fever Rickettsiae in Cultures.** —*J. exp. Med.* **61.** 17-26. 3 tables. [21 refs.]

Cultures on serum-Tyrode medium of typhus fever rickettsiae were found to remain viable for a longer period at 37°C. than at 20°C., and longer at 20°C. than at –4°C. Cultures stored at 37°C. and –20°C. survived for several months. The author is unable to explain the fact that the cultures failed to survive long at intermediate temperatures, those at 20°C. being dead after four weeks and those at –4°C. after ten days.

Typhus-infected tissues remained infectious for ten weeks whenkept in serum-Tyrode mixture at 37°C.—Gwilym O. Davies.

Knutti, R. E., & Hawkins, W. B. (1935). **Bartonella Incidence in Splenectomized Bile Fistula Dogs.**—*J. exp. Med.* **61.** 115-125. 1 fig. on 1 plate, 4 charts. [11 refs.]

The periodic occurrence of anaemia and over-production of bile-pigment, which is known to occur spontaneously in splenectomized bile-fistula dogs, have hitherto remained unexplained. In this paper the authors give their evidence for concluding that it is due to *Bartonella canis* in the blood.

In three out of four dogs studied, these periodic changes have coincided with the appearance in the blood of bodies morphologically indistinguishable from *Bart. canis*, and injections of blood containing these bodies into other splenectomized dogs have given rise to the same changes.

Simple splenectomized dogs have not shown such spontaneous periods of anaemia ; it is therefore suggested that the lack of certain bile constituents may play a part in lowering the resistance of the dogs.

Attempts to cultivate the parasite were not successful. Intravenous injections of " neosalvarsan " appear to be specific for the condition, and spleen extract seems to exert an inhibitory effect upon the periodic changes.—GWILYM O. DAVIES.

NEITZ, W. O., ALEXANDER, R. A., & DU TOIT, P. J. (1934). **Eperythrozoon ovis (sp. nov.) Infection in Sheep.**—*Onderstepoort J. vet. Sci.* **3.** 263-271. 4 figs. on 2 plates. [6 refs.]

A short review is given of some of the literature on *Bartonella*, *Grahamella* and *Eperythrozoon*, after which the authors discuss their observations on an eperythrozoon observed in sheep at Onderstepoort. The morphology of the parasite, which is both supra and extra-cellular, is fully described. It is a small ring-shaped organism 0·5 to 1μ in diameter. It produces a febrile reaction after an incubation period of four to 15 days. A marked anaemia occurs when the parasites begin to disappear from the blood and this may last for some weeks. A fatal termination has not so far been observed.—E. M. ROBINSON.

DISEASES CAUSED BY VIRUSES.

FRENCH, M. H. (1934). **Variations of Serum Protein Fractions during an Attack of Rinderpest.**—*Ann. Rep. Dept. Vet. Sci. & Anim. Husb., Tanganyika, 1933.* pp. 42-48. 9 tables.

(1). SUSCEPTIBLE OXEN.—The variations in the different protein fractions during rinderpest were studied in the cases of three susceptible animals. Two of these made spontaneous recoveries with no complications and the third died with complications of piroplasms and trypanosomes. In the cases which recovered the total proteins, total globulin and euglobulin at first fell as in an animal fatally infected, but returned to higher levels later.

(2). VACCINATED OXEN.—Two animals vaccinated with formolglycerin vaccine 11 months previously were given virulent blood and the protein changes recorded. The total protein and albumin fell steadily for four weeks whilst the total globulin remained approximately constant. The relative amount of euglobulin rose during the first three weeks.

Two animals were given fairly old vaccine and six weeks later inoculated with virulent blood. The blood changes resembled those of susceptible oxen making spontaneous recoveries. The total protein, total globulin and albumin contents fell steadily whilst the relative proportion of euglobulin at first fell but rose again later.

Hyperimmunization was by the intrarumenal method, the ox being bled after an interval of a fortnight and every week subsequently to make five bleedings in all. The biggest change was associated with the euglobulin fraction. This made a very big increase as a result of hyperimmunization, but the relative and absolute amounts decreased with increasing interval from the time of hyperimmunization.

—S. A. EVANS.

CORNELL, R. L. (1934). **Rinderpest in Wildebeeste.**—*Ann. Rep. Dept. Vet. Sci. & Anim. Husb., Tanganyika, 1933.* pp. 37-42.

This author concludes that " On epidemiological grounds, from observations on sick wildebeeste made both ante- and post-mortem, and from the result of a single positive transmission experiment, it appears certain that these animals can contract fatal rinderpest and can transmit the disease to cattle."—S. A. EVANS.

ALLAN, W. A. (1934). **Rinderpest in Game.**—*Rep. vet. Dep. Uganda 1933.* pp. 48-53. 1 map.

The author records the course of a rinderpest infection in game in a district of Uganda between 1929 and 1934. The main cause of the spread of the disease was the stampeding of infected buffaloes. The stampeding animals often appeared to move in a narrow line leaving a trail of dead, but with little tendency to infect local game. In other cases the animals did not stampede and it is recorded that 86 buffaloes died in one area in the course of ten weeks. In some cases the disease attacked pig and bushbuck, but these animals showed no tendency to stampede, and only a slow spread resulted from their infection. Waterbuck were also found dead. After the passage of rinderpest, the total abandonment of a salt lick became very marked. It is uncertain whether this was due to the complete killing off of local game, or to a shunning of the lick by survivors and non-susceptible animals.
—U. F. RICHARDSON.

CARPANO, M. (1933). Sulla depurazione in vitro del virus della peste bovina. [**Purification of Rinderpest Virus** *in vitro*].—*Clin. vet., Milano.* **56.** 932-936. [3 refs.]

To overcome contamination of rinderpest virus, especially by protozoa, the author recommends that the animal used to produce the virus should be bled on the first or second day after the temperature has started to rise, and that the blood be mixed with an equal volume of 1 per cent. trypan blue. The mixture should not be used for three or four days and double the dose must be given. Such blood is capable of producing a typical reaction. There is no reason why other drugs should not be used provided that it is proved that they do not injure the rinderpest virus. [This principle has been used in Nigeria and East African territories for years, see this *Bull.* **5.** 73. – Ed.].—J. A. NICHOLSON.

TOMAN, R. V. (1934). Over actieve immunizatie bij mond- en klauwzeer. [**Active Immunization against Foot and Mouth Disease**].—*Tijdschr. Diergeneesk.* **61.** 901-906. [English, French and German summaries : abst. from orig.]

Attempts to immunize cattle against foot and mouth disease with formalinized blood of affected cattle showing a high temperature were not successful, but a formalinized organ vaccine (spleen, liver) appeared to give a partial immunity, as inoculated animals resisted the disease for about ten days when exposed to infection. The tests were made entirely in the field, during the outbreaks of foot and mouth disease which occurred in Holland in 1930 and 1932.—J. E.

PYL, G. (1933). Die Bedeutung der Kolloidalen Träger für die Beständigkeit des Virus der Maul- und Klauenseuche. [**Importance of the Colloidal Container for the Stability of Foot and Mouth Disease Virus**].—*Hoppe-Seyl. Z.* **218.** 249-262. 2 figs., 1 table. [10 refs.]

There are two values of pH at which the virus of foot and mouth disease can be maintained at maximum concentration, pH 3·0 and pH 7·6. Between the two

maxima lies a minimum at pH 6·0 to 6·5. Virus in acid suspension gives positive results more regularly, when inoculated into guinea pigs ; possibly this is because the virus is not destroyed by the alkalinity of the tissue lymph. The iso-electric point of the virus lies between pH 3·5 and 3·9. The maximum flocculation point is pH 3·9, which is not specific for this virus. These factors all indicate that this virus, like enzymes, is adsorbed on to a colloidal carrier. There is a different carrier in acid and in alkali solutions. The ampholyte characters of foot and mouth disease virus suggest albuminoid characters.—E. J. PULLINGER.

WITTE, J. (1933). Untersuchungen über den Bläschenausschlag (Exanthema pustulosum coitale) des Rindes. [**Exanthema Pustulosum Coitale of Cattle**].—*Z. InfektKr. Haustiere.* **44.** 163-191. 18 plates, 1 chart.

Extensive abortion at an early stage of pregnancy, as well as metritis and pyometra, occur amongst cows in certain states in Germany. There is also a very high incidence of exanthema pustulosum coitale. Though the conditions occur side by side, evidence indicates that quite distinct aetiological factors come into play. Exanthema pustulosum coitale is caused by a filtrable virus which resists the destructive action of 50 per cent. glycerin for at least 36 days, and survives in saline for 229 days. Whilst vaginal lesions have been produced artificially with virus-containing material, it has not proved possible to produce any uterine disturbance in this way, so that metritis and abortion are probably due to some different cause.

Lesions generally seen in exanthema pustulosum coitale consist of small yellowish-white pustules or yellowish follicles in the vagina. In cases produced artificially with a cell-free filtrate of pustule fluid, small pustules appeared on the vaginal mucosa within three days. These became confluent and, by the fifth day, extensive erosions were present. Thereafter, healing occurred and, by the 15th day, multiple reddish nodules marked the site of infection. The differential diagnosis from contagious granular vaginitis is important and presents certain difficulties. In the early stage of infection, extensive pustule formation characterizes exanthema pustulosum coitale ; in advanced cases, when the pustules have healed, it may be necessary to resort to a histological examination. Follicles resulting from exanthema pustulosum coitale show a diffuse infiltration of lymphocytes, neutrophiles and connective tissue cells, whereas a follicle of contagious granular vaginitis consists of a sharply demarcated aggregation of lymphocytes. Infection may be extremely difficult to diagnose in the male, for lesions on the penis persist for a short while only, though the ability to transmit the infection persists for a considerable time.

In addition to cattle, goats and sheep may be artificially infected. Natural infection usually follows coitus, and the danger of carrier cows and bulls is obvious. No appreciable immunity appears to follow infection.—E. J. PULLINGER.

PATRIAT, ROSSI, & VITU. (1933). Observations cliniques, hématologiques et anatomo-pathologiques de quelques cas de typho-anémie infectieuse du cheval. [**Clinical, Haematological and Pathological Observations on Some Cases of Infectious Anaemia in the Horse**].—*Bull. Soc. Sci. vét. Lyon.* **36.** 250-265.

This is the report of a conference of directors of state veterinary services in France, convened in consequence of the alarming extension of equine infectious anaemia in certain parts of the country. A number of cases of the disease were collected at Nancy for their consideration and this article records the results of the clinical and haematological observations made and the *post-mortem* findings. They

conclude that, notwithstanding certain difficulties, the diagnosis of this disease is a practical proposition, when *post-mortem* examination of certain animals can be undertaken during an outbreak, as well as the necessary observations and tests that can be done on the live animals, and that it may, therefore, be added to the list of notifiable diseases.—C. DAVENPORT.

I. OPPERMAN, T. (1933). Die diagnostische Auswertung der Sublimatprobe (nach Bennet, Horgan, Kenny bzw. Fulton) bei der ansteckenden Blutarmut der Pferde. [**Sublimate Diagnostic Test for Equine Infectious Anaemia**]. —*Arch. wiss. prakt. Tierheilk.* **66.** 485-504. 10 tables. [25 refs.]

II. HECKE, F. (1934). Der diagnostische Wert der Sublimatprobe bei der ansteckenden Blutarmut der Pferde. [**Diagnostic Value of the Sublimate Test for Equine Infectious Anaemia**].—*Ibid.* **67.** 410-419. 6 tables. [10 refs.]

III. STEFFAN, H. (1934). Das Herz bei inneren Erkrankungen des Pferdes. II. Mitteilung: Infektiöse Anämie. Elektro- und phonokardiographische Untersuchungen. [**The Heart in Internal Disease of the Horse. II. Infectious Anaemia**].—*Ibid.* **68.** 328-344. 5 figs., 1 table. [23 refs.]

IV. DOBBERSTEIN, J. (1934). Kritische Betrachtungen zur Pathogenese der ansteckenden Blutarmut des Pferdes. [**Pathogenesis of Equine Infectious Anaemia**].—*Berl. tierärztl. Wschr.* **50.** 192-196. 12 figs. [28 refs.]

V. HECKE, F. (1934). Verbreitungsweise und Bekämpfung der ansteckenden Blutarmut der Pferde. [**Epidemiology and Control of Equine Infectious Anaemia**].—*Dtsch. tierärztl. Wschr.* **42.** 403-408. [54 refs.]

I. In applying the sublimate test [see this *Bull.* **3.** 357.] to the diagnosis of infectious anaemia of horses, it should be remembered that instructions must be followed accurately when making up the reagents, since minor differences such as the nature of the water used as solvent may affect the ultimate result. Furthermore it should be remembered that the sublimate reaction grows weaker as the age of the serum increases.

When the sublimate test gives positive reactions in dilutions (of the reagent) of 1 : 40,000 and higher, a raised euglobulin content of the serum is indicated; and it may be taken that a high percentage of such animals (about 90 per cent.) are suffering from infectious anaemia. At 1 : 30,000, 50 per cent. of such reactors are probably infected; at lower dilutions the test becomes more unreliable. It is stressed, however, that a negative or a very weak reaction does not rule out the possibility of an animal being infected. In doubtful cases, it may be possible to make a diagnosis by correlating the results of this test with those of other diagnostic procedures.

II. The author concludes that the sublimate test is not specific for infectious anaemia. Serum of horses suffering from anaemia may give weak reactions to this test, whilst serum of healthy horses may react strongly. The frequency of incorrect diagnosis based solely on this test is so high that it renders the test useless.

III. The author has prepared and analysed electro-cardiographs of four cases of equine infectious anaemia. In cases of non-specific anaemia, cardiac rhythm is altered but in the specific disease the rhythm is unaltered during and after the fever reaction. It must be accepted that whatever harm is done by the virus or by by-products of infection, the centres controlling heart rhythm remain unharmed.

IV. A review of the literature dealing with this subject is given. The pathogenesis of the disease must be studied on a basis of the histological changes in certain tissues. In the liver and spleen marked haemosiderosis is seen, together

with extensive accumulation of round cells, proliferation of histiocytes, and phagocytosis of erythrocytes and of haemosiderin by cells of the reticulo-endothelial system. Similar changes may be seen in the myocardium and kidneys. The hypothesis is advanced that the vascular mesenchyme offers the first line of resistance to the virus. The defensive reaction is of three types :–(1) histiocyte reaction ; (2) lymphoid reaction, and (3) fibrillar reaction. These reactions take place in the above sequence. Plates are included which show these three stages in various tissues ; in this connection the plates showing the amount of collagen fibrils in normal tissue and the increased amount in tissue from chronic cases of infectious anaemia are particularly interesting. The histological sequence in this disease is not unlike that of protracted protein poisoning.

V. Control of infectious anaemia depends upon the successful identification of the chronic carrier. In such animals virus is to be found in all tissues, and infection rarely dies out before death of the carrier. Virus is present in the urine, milk, discharges from the eyes and nose, and probably in the faeces. It is highly resistant to the effects of cold and normal temperatures, and to desiccation at such temperatures, but is very susceptible to the action of heat and sunlight. Phenol preparations, toluol, chloroform, alcohol and ether are unsatisfactory as disinfecting agents as the virus is very resistant to them. Formalin is one of the best disinfectants for this virus. In nature, infection is spread by direct contact of susceptible animals with discharges or similar material from infected animals. Infection may also be spread by intermediate insect vectors such as *Stomoxys*, *Chrysops*, *Tabanus* and *Anopheles*. Also there is no reason why infection should not be spread by unweaned foals or by human beings.

Control methods may be devised with a view to the foregoing considerations. Such measures would include the identification and elimination of all virus carriers, improvement of hygienic conditions, the plentiful use of formalin as disinfectant where infection is suspected, exclusion as far as possible of insect vectors, and the avoidance of spread of infection by careless attendants.—E. J. Pullinger.

Hjärre, A. (1933). Leverförändringar vid infektiös anämi hos häst. **[Changes in the Liver in Equine Infectious Anaemia]**.—*4. Nord. Vet.-mötet. Helsingfors, 1933.* pp. 361-377. [Discussion pp. 377-414]. 4 figs. [25 refs.] [English summary : abst. from orig.]

The author describes the *post-mortem* findings in two horses which died from experimental infectious anaemia with symptoms of haemoglobinaemia and haemoglobinuria. In both cases there were found in the liver numerous small infarcts extending from the central vein into the intermediate zone of the lobule. Their boundaries were sharp and frequently surrounded by a narrow zone of fatty infiltration. The reticulo-endothelium of the liver displayed erythrophagy and haemosiderosis, but no hyperplastic processes.

Similar changes were found in the livers of two horses which had died suddenly and were suspected to be affected with infectious anaemia. These necrotic foci are in perfect morphological agreement with those previously described by the author in puerperal haemoglobinaemia in cattle ; they are a characteristic secondary symptom of rapid decomposition of erythrocytes and are miliary infarcts with thrombosis.

In the discussion which followed, Wall stated that his examinations of chronic cases of the disease revealed changes in the liver and the kidneys which he considered to be a serous hepatitis and a serous glomerulo-nephritis. Hjärre did not agree with this.—Gustav Naerland (Farsund).

I. WEISCHER. (1935). Beobachtungen über die infektiöse Bronchitis des Rindes. [**Infectious Bronchitis of Cattle**].—*Berl. tierärztl. Wschr.* **51.** 1-2. [21 refs.]

II. WALDMANN, O., & KÖBE, K. (1935). Experimentelle Untersuchungen über die infektiöse Bronchitis des Rindes. [**Infectious Bronchitis of Cattle**].—*Ibid.* 2-3. [3 refs.]

I. This condition has already been described as it occurs in horses, in which animals it is frequently called Hoppegarten cough [this *Bull.* **5.** 268]. In bovines the condition is highly contagious and cattle fairs play a considerable part in the spread of infection. When infection is introduced on to a clean farm 60 to 80 per cent. of bovines contract the disease, the period of incubation ranging between eight and ten days. There is no record of infection spreading to horses or pigs, though it is quite conceivable that light attacks, which escape the notice of the farmer, may occur. Clinically the disease is characterized by a cough, discharge from the nose and eyes, tenderness of the larynx and throat, inappetence, absence of rumination and rapid respiration. Nasal discharge, which is at first serous, later becomes purulent. General symptoms include high fever and loss of condition and there is a painful cough. On *post-mortem* examination of carcasses of slaughtered animals a catarrhal pneumonia is seen, and also catarrhal broncho-pneumonia, pulmonary oedema, interstitial emphysema and atelectasis.

II. A bacterial examination of material from 20 cases diagnosed as bovine infectious bronchitis gave in six instances negative findings ; in six cases a streptococcus, differing from *Str. equi*, was found [*Str. equi* is a recognized secondary invader in equine infectious bronchitis (Hoppegarten cough)] but resembling a common saprophyte of the bovine respiratory tract ; the remaining cases contained mixed contaminants. It was shown by artificial infection that the disease could be transmitted from the horse to the ox, from the ox to the horse and from ox to ox by the inoculation of cell-free filtrates of infected material.—E. J. PULLINGER.

SHOPE, R. E. (1934). **Pseudorabies as a Contagious Disease in Swine.**—*Science.* **80.** 102-103. [7 refs.]

In pigs, the virus of Aujeszky's disease [pseudorabies, mad itch, infectious bulbar paralysis] given subcutaneously causes a mild disease, the symptoms observed being depression, decreased appetite and a febrile reaction of four to six days' duration. Rarely, indefinite nervous symptoms occur.

The disease can be produced intranasally, intramuscularly or by feeding large doses of the virus. It is contagious in pigs. The virus could only be found in the nasal passages and symptoms were reproduced in rabbits from infection with nasal washings. The virus was present in the nose during the febrile reaction and sometimes for a day or two longer. It was not found in the blood, brain or other tissues, except the lungs.

The mild type of disease, with symptoms which could be overlooked, together with its contagious nature, suggests that the pig may act as a reservoir of the infection.—N. H. BROOKSBANK.

BURNET, F. M. (1934). **Louping Ill Virus as a possible Cause of the X Disease Epidemics of 1917-1918.**—*Med. J. Aust.* May 26th. 679-681. [4 refs.]

Outbreaks of human encephalitis, of obscure origin, occurred in certain isolated sheep-raising districts of Australia in 1917 and 1918. This disease, which was termed " X disease ", was at the time demonstrated to be caused by a filtrable virus with similar properties to those which " louping ill " virus has more recently been shown to possess. " Louping ill " has never been recorded in sheep in Australia, but it is suggested that it may have been present in a latent form and

have been transmitted to human beings, possibly by flies, and caused the " X disease " epidemics.—W. I. B. BEVERIDGE.

I. ELFORD, W. J., & GALLOWAY, I. A. (1933). **The Size of the Virus of Louping-Ill of Sheep by the Method of Ultrafiltration Analysis.**—*J. Path. Bact.* **37.** 381-392. 7 tables. [14 refs.]

II. CUILLÉ, J., & CHELLE, P. (1933). Tremblante et louping-ill. [**" Tremblante " and " Louping Ill "**].—*Rev. vét., Toulouse.* **85.** 674-679. [20 refs.]

III. LESTOQUARD, F. (1933). Le " louping-ill ", une encéphalo-myélite du mouton. [**" Louping Ill ", an Encephalomyelitis of Sheep**].—*Ibid.* 680-682. [1 ref.]

I. By the method of ultrafiltration analysis, using carefully graded collodion membranes, the size of the virus of " louping ill " has been estimated to be 15-20$m\mu$. The virus was still infective for sheep after 40 passages in mice extending over a period of 687 days. Mice were successfully infected by the intranasal route. The virus quickly becomes inactivated when kept in broth at room temperature, 18° to 20°C., but may be stored satisfactorily for longer periods at 4°C. in slightly alkaline broth, pH 7·5 to 8·5.

II. Many French authors appear to have confused the disease known in their country as " la tremblante " with " louping ill ", sometimes called " trembling ", as it occurs in Great Britain. This article contrasts and compares the two diseases, showing clearly that they are different pathological entities. " La tremblante " is a sporadic, non-inoculable disease. It has an afebrile chronic course and is characterized by general hyperexcitability, cutaneous hyperaesthesia, locomotor inco-ordination and by the absence of lesions in the central nervous system. " Louping ill ", on the other hand, is an enzootic, tick transmitted, inoculable disease, characterized by convulsive movements of the head and limbs and, histologically, by lesions of an encephalomyelitis. The description of " la tremblante " agrees with certain forms of " scrapie " in Great Britain.

III. In France opinions are divided as to whether the disease of sheep known there as " tremblante " is identical with " louping ill " as it occurs in Great Britain. The author has summarized the results of the investigations into " louping ill " in Great Britain, which will enable French workers to make easier comparison of the two diseases.—W. S. GORDON.

VERGE, J. (1934). Les maladies communes à l'homme et aux animaux. VII. Le " louping-ill " ou méningite cérébro-spinale enzootique du mouton est-il transmissible à l'homme ? [**Diseases Common to Man and Animals. VII. " Louping ill "**].—*Rev. gén. Méd. vét.* **43.** 780-783. [15 refs.] [For absts. of previous articles of this series, see this *Bull.* **5.** 417].

The question of whether " louping ill " is transmissible to man is discussed, reference being made to the report from America of laboratory workers having contracted an infection with the virus. In addition, the author points out other infections due to viruses contracted in the laboratory, namely, an ascending myelitis contracted after the bite of a monkey and the questionable transmission of encephalomyelitis of horses to man.—R. LOVELL.

DE PAOLIS, E. (1933). Di alcune forme di agalassia contagiosa della pecore e delle capre. (Contributo alla conoscenza della malattia). [**Forms of Contagious Agalactia of Sheep and Goats**].—*Monogr. Staz. sper. " Salvatore Baldassare " Foggia.* pp. 125. 16 figs. [60 refs.]

Earlier work has established the fact that contagious agalactia of sheep and

goats may be transmitted by natural or artificial means ; this has enabled much progress to be made, but many points still remain obscure, particularly the identification of the specific pathogenic organism. The disease is fairly common in southern Europe and north Africa, and an outbreak may at times assume enzootic proportions. It attacks animals of all ages and the incubation period varies within wide limits. Under natural conditions, definite symptoms may not appear for more than 60 days. Three characteristic forms of the disease are met with ; these may be present together but it is more usual to find only one form in an individual animal, although all three forms may be equally distributed throughout a flock. The characteristic lesions are found in the eyes, joints or mammary gland ; lesions in the respiratory or intestinal tracts may be associated with any of these three characteristic forms.

When the eyes are affected, the first symptoms observed are lacrymation, conjunctivitis and photophobia. Vascularization and opacity of the cornea then develop ; keratitis, ulceration and perforation of the cornea ensue and, with increased pressure, extravasation of the contents of the eye and luxation of the lens may occur. Healing is extremely slow and one or both eyes may be affected.

In the joints, swelling of the periarticular tissue is evident, and such lesions as synovitis, simple and ossifying arthritis, erosion of the articular cartilage, etc., may be found. The affected joint is very painful and cannot be fully flexed or extended.

A mammary infection is indicated by a reduction in milk yield, accompanied by atrophy of the gland. Circumscribed nodules may be felt on palpation, and, later, abscess formation and induration of the supramammary lymph gland may occur. The milk becomes watery and contains greyish white clots, or it becomes yellowish green and almost solid. Mammary lesions are more common in lactating animals.

Congestion, oedema and infiltration and hepatization may be found in the lungs. The disease develops slowly and may be mild or acute, with a mortality of 20 to 30 per cent. In pregnant animals, abortion is common and they remain ill for several months before complete recovery.

The author was able to reproduce the disease in sheep and lambs by subcutaneous inoculation of emulsions of cornea, serous fluid from the lungs, or milk. In each case the material was first passed through a Maassen candle. Direct bacteriological examination of material from affected animals revealed the presence of streptococci and pyogenic organisms, but these alone will not cause the disease and may be considered as secondary invaders. The virus is not always easy to demonstrate and shows varying degrees of pathogenicity.

Encouraging results were obtained by using a hyperimmune serum prepared by the inoculation into healthy sheep of filtrates from affected material and cultures of the associated bacilli. The author also succeeded in preparing a polyvalent vaccine from pleural filtrate containing the virus and cultures of *Corynebact. pyogenes*, staphylococci and streptococci. In both cases a large-scale trial is required before it can be definitely established whether an active or passive immunity can be produced by these methods.—J. A. Nicholson.

Pirie, Antoinette. (1934). **Dehydrogenases of the Filtrable Organism of** *Agalactia*. —*Bio-chem. J.* **28.** 411-415. 4 tables. [7 refs.]

A survey of the oxidizing enzymes of agalactia has been made, as determined by the anaerobic-methylene blue and the oxygen-uptake methods. The most active dehydrogenases are those attacking lactate, adenylic acid, adenosine, fructose and hexosediphosphate. Other dehydrogenases need very high substrate concen-

trations. The relative strength of the dehydrogenases varied from culture to culture, but this variability did not appear to depend entirely upon the medium or the phase of growth at which the enzymes were examined. The lactate enzyme, like that of *Bact. coli*, is inhibited by gluconate and oxalate.—W. R. WOOLDRIDGE.

MASON, J. H., & ALEXANDER, R. A. (1934). **Heartwater in Sheep. The Weil Felix Reaction and an Investigation into the Bacterial Content of the Blood with Particular Reference to the Use of " K " Medium.**—*Onderstepoort J. vet. Sci.* **3.** 7-19. 1 table. [16 refs.]

An attempt was made to demonstrate agglutinins for *Proteus* X 19, X 2 and X K in the sera of sheep reacting to heartwater and in recovered animals including hyperimmunes, but without success. Attempts to isolate proteus types or serologically similar organisms from sheep affected with heartwater were unsuccessful. Blood, scrapings from the tunica intima, and urine were used for cultivation experiments using a variety of media including the " K " medium of Kendall. An organism of the rickettsia type was isolated from one sheep, but was found to be non-pathogenic.—E. M. ROBINSON.

GERLACH, F. (1933). Infektiöse Anämie der Schafe. **[Infectious Anaemia of Sheep].**—*Wien. tierärztl. Mschr.* **20.** 577-588. 4 figs.

A detailed description of an anaemia in imported merino sheep or merino crosses in Turkey imported mainly from Hungary. It was investigated in 1932 by LESTOQUARD, who had previously studied the identical condition in Algeria, and by EKREM. Gerlach studied it on a visit to Turkey in 1933.

The disease is characterized by a progressive anaemia with a fatal termination, though it appears from evidence that carriers exist. The anaemia present is of the aplastic type.

The *post-mortem* changes are characteristic :– extreme anaemia, replacement of the heart fat by gelatinous material, pale myocardium, brownish-yellow fluid in the body cavities, voluntary muscles pale and flabby, lymph glands enlarged and haemorrhagic, spleen and liver unaltered, bone-marrow transformed into a gelatinous transparent mass and haemorrhagic, and petechiae in the cortex of the kidneys.

The differential diagnosis offers few difficulties when worm invasion and anaplasmosis have been eliminated.

The disease is transmissible to sheep by injections of blood and Gerlach succeeded in reproducing the disease in a sheep and a horse by a blood filtrate. This fact raises the question of the identity of this disease and of equine infectious anaemia.

No method of treatment or immunization is known.—J. E.

LEVADITI, C., SCHOEN, R., & LEVADITI, J. (1934). Les corpuscules oxyphiles inclus dans les épithéliums cornéens chez les animaux rabiques. **[Oxyphilic Corpuscles in the Corneal Epithelium of Rabid Animals].**—*C. R. Soc. Biol. Paris.* **117.** 586-589. [3 refs.]

Previous work has shown that the inoculation of street rabies virus into the cornea, or into the anterior chamber of the eye of rabbits, results in infection, along with the production in the corneal epithelial cells of specific oxyphile bodies resembling Negri bodies.

The authors have extended this work to other species of animals. A few oxyphile bodies were found in the corneal epithelium in one out of several mice. No bodies were found in four guinea pigs, two cats, one dog and two monkeys.

In monkeys so inoculated, however, the cornea may contain virus. Also, out of six rabbits in which acidophile corpuscles were present in the cornea, this tissue was shown to contain virus in two cases only: in one rabbit, in the cornea of which no bodies were demonstrated, virus was present.—A. BROWNLEE.

WHARTON, D. R. A., & WHARTON, Martha W. (1934). **Canine Distemper: The Disease and the Nature of the Virus.**—*Amer. J. Hyg.* **19.** 189-216. 6 tables. [40 refs.]

This paper describes an investigation into the physiopathology of distemper. The line of investigation was suggested by the absence of tissue damage as shown by histological examination of tissues.

It is claimed that distemper is essentially an acute anaemia and hypoglycaemia. The authors believe that coryza, serous exudate from the eyes and coughing are not essential parts of the virus disease, but are due to the climatic conditions under which experimental animals are kept. They state that these clinical signs are not seen in experimental animals kept in warm, dry and draught-free quarters.

The reduction in haemoglobin and blood sugar is said to be demonstrable a few hours after the injection of virus. The blood of infected puppies is increasingly glycolytic as the disease progresses. The glycolytic action of the virus is inhibited by immune serum. Loss of infectivity coincides with the commencement of recovery of the blood sugar and haemoglobin.

The disease distemper is stated to be a pathological condition of the red blood cell and an exaggeration of the glycolytic and haemoglobinolytic mechanism of the cell.

Immunity in distemper involves an inhibitory factor which is neutralizing in character, and the virus is intracellular in its action.—G. F. BODDIE.

LEHNERT, E. (1934). Experimentell valpsjuka i valpsjukebekämpandets tjänst. **[Immunization against Dog Distemper].**—*4. Nord. Vet.-mötet. Helsingfors, 1933.* pp. 414-423. 3 tables. [25 refs.] [English summary: abst. from orig.]

After a review of the literature on immunization experiments in dog distemper with formalinized or otherwise attenuated virus, the author gives details of similar experiments carried out by himself with killed virus in a 10 per cent. brain-suspension sterilized by boiling. From the results obtained, he draws the conclusion that one or two successive subcutaneous inoculations (given at three-day intervals) of 5 c.c. of suspension containing killed virus set up a condition in dogs in which there is resistance to a subsequent inoculation of living distemper virus, carried out three to 28 days after vaccination.

There is also described a case of experimental distemper showing no other signs than nervous symptoms. The dog had been infected with brain pulp from an earlier experimental case exhibiting nervous disturbances.

In the discussion which followed, THOMSEN (Copenhagen) mentioned the favourable results obtained with Laidlaw-Dunkin vaccine in Denmark.

—GUSTAV NAERLAND (FARSUND).

BODDIE, G. F. (1934). **The Clinical Aspect of Distemper Immunisation.**—*Vet. Rec.* **14.** 507-510. [2 refs.]

In this paper the author raised for discussion a number of points which had weakened his confidence in the methods used in the immunization of dogs against distemper. After speaking favourably of the use of serum as a preventative if given early, he referred to the serum-vaccine method, pointing out the obvious difficulty of striking a correct balance between the two components. In his experience

immunity was not always produced and nervous symptoms sometimes developed. He favours the vaccine-virus method and details his procedure when using it.

Not being satisfied with the methods at present in vogue the author has been carrying out experiments on less orthodox lines with a view to establishing a safer and surer procedure. He has been using repeated doses of vaccine alone, following the vaccine-virus by a dose of serum and, lastly, exposing to natural infection after vaccine treatment only.

There was discussion on the paper at the meeting at which it was read.
—N. S. Barron.

Apple, J., & Ackermann, Ella L. (1935). **Contagious Feline Enteritis – A Virus Disease.**—*Vet. Med.* **30.** 14-18. [12 refs.]

A good summary of the literature of 1928 to 1934 on infectious enteritis of cats [see also this *Bull.* **5.** 19].—J. E.

I. Hindle, E., & Findlay, G. M. (1933). **Bacteriological Studies on Feline Distemper.**—*Proc. R. Soc. Med.* **26.** 197-202. 3 tables. [16 refs.]

II. Findlay, G. M. (1933). **Cat Distemper.**—*Vet. J.* **89.** 17-20. [12 refs.]

I. This is a detailed report of the bacteriological findings from 300 cases of feline distemper, none of the organisms isolated being considered to have greater aetiological importance than that of a secondary invader.

The authors refer to their previous work [(1932). *J. comp. Path.* **45.** 11.], in which they were able to reproduce the disease by inoculation with bacteria-free material, and give evidence which supports the view that cat distemper is a virus disease.

In the discussion which followed Hamerton referred to distemper in the smaller felines at the Zoological Gardens, London, and various veterinary practitioners spoke on the relationship between distemper and infectious enteritis of cats, the co-identity of which was not agreed upon.

II. This is a short general account of cat distemper.—J. E.

Lubbehusen, R. E., & Ehlers, D. P. (1934). **A Study of the Comparative Value of Fowl-Pox Virus and Pigeon-Pox Virus Vaccines for Immunization against Fowl-Pox.**—*J. Amer. vet. med. Ass.* **85.** 324-341. 4 tables. [7 refs.]

The authors carried out comparative experiments with fowl pox virus and pigeon pox virus vaccines to assess their value for the protection of fowls of different ages against fowl pox.

In preparing the vaccines the fowl pox virus was subjected to dry air at 37°C. for 48 hours and stored as powder at 6°C. The pigeon pox vaccine was prepared by removing the inoculated area of skin from pigeons on the tenth day and suspending in 25 per cent. glycerin-distilled water. The vaccine was prepared from this stock virus by diluting it with 25 per cent. glycerin-distilled water to make a 1 per cent. suspension.

The pigeon pox vaccine was found to be of small value, but might, in the authors' opinion, be substituted for fowl pox virus vaccine where a short interval protection was desired.

[The poor results obtained by the authors with the pigeon pox virus vaccine is perhaps not surprising, in view of the method of preparation employed. The most satisfactory method of preparing the pigeon pox virus vaccine is to remove the crusts from the inoculated areas on the pigeons' breasts, dry rapidly over P_2O_5 *in vacuo* and store in sealed tubes at about 2°C. Immediately before use, sufficient crusts are powdered and suspended in 50 glycerin-saline to make a 1 per cent. suspension].—T. M. Doyle.

DELAPLANE, J. P., & STUART, H. O. (1933). **The Efficacy of Pigeon Pox Vaccine in the Vaccination of Chickens against Fowl Pox.**—*Bull. R. I. agric. Exp. Sta.* No. 238. pp. 8. 2 tables. [6 refs.]

The authors tested the protective power against fowl pox virus of a commercial pigeon pox virus vaccine. Chickens vaccinated at 6, 8, 10, 12 and 14 weeks of age proved susceptible to both artificial and natural infection with fowl pox virus when tested four months after vaccination. Vaccinated pullets resisted fowl pox infection when tested after a period of two months.

[The commercial vaccine, the method of preparation of which was apparently unknown, was evidently weak. It is to be noted, however, that the vaccine was applied with a brush, instead of to the scarified skin – the routine method in Europe].—T. M. DOYLE.

BIERBAUM, K., & KAYSER, W. (1934). Beitrag zur Schutzimpfung gegen Hühnerpocken mit virulentem Hühnerpockenvirus. [**Preventive Vaccination against Fowl Pox with Virulent Virus**].—*Tierärztl. Rdsch.* **40.** 887-888. [6 refs.]

American authors – JOHNSON (1927), SAWYER (1929), BEAUDETTE (1929) and STAFSETH (1929) – have recommended vaccination with virulent fowl pox vaccine by cutaneous and subcutaneous methods and by scarification of feather follicles. German authors have found that such a vaccine, as usually prepared, is heavily contaminated with bacteria.

Six pigeons vaccinated with fowl pox virus vaccine all died when infected with fowl pox 27 days later. Seven vaccinated hens developed typical fowl pox ; in four birds the lesions remained localized, and the other three birds showed a general infection. The duration of the immunity was two and a half months. The vaccination did not prove sufficient and the vaccinated birds remained carriers of the virus for more than two months. Such birds, therefore, are likely to spread the disease among the remaining unvaccinated fowls.

—W. VON DURING (BERLIN).

BALOZET, L. (1934). Expériences sur la peste aviaire. [**Fowl Plague Research**]. —*Arch. Inst. Pasteur Tunis.* **23.** 49-52. [1 ref.]

The pigeon has been considered refractory to fowl plague by the natural means of transmission. Experimentally the pigeon is very difficult to infect with this disease. KRAUS and DOERR have shown that, although the pigeon does not show symptoms of the disease, the virus can be recovered from the nerve centre (where it has been introduced) seven to 15 days after inoculation.

The author records experiments of inoculation of the virus into the brain of pigeons with recovery of the virus five to eight days later. Inoculation of the virus into the muscles causes no symptoms, the virus is rapidly destroyed and at the fifth to eighth day following inoculation cannot be recovered from the blood, internal organs or nerve centre. Following the second passage of the virus from brain to brain of the pigeons, the virus became more virulent. Serious symptoms in the birds are noticed and few recover. Following the tenth passage, death regularly occurs in six to eight days and after more passages death results in two to three days.

The symptoms noted are excitement and paralysis varying with the individual bird, some showing an appearance of deep sleep, contraction of the muscles as in tetanus and the bird acts as though blind.

Up to the fourth passage the virus remains localized in the nerve centre, but with the later passages the blood and the organs contain the virus.

After the 20th passage the material from the brain of an inoculated pigeon was inoculated in a dose of 10 cg. into the muscle of four pigeons, two of which were inoculated with a drop of sterile physiological saline into the brain. One of the latter died and the brain and organs contained active virus.

A small portion of brain from a 40th passage pigeon, when inoculated into fowls, caused death in less than 48 hours.

The author has confirmed the work of KRAUS and DOERR that the virus of fowl plague, when inoculated into the brain of a rabbit, can be recovered 24 to 48 hours later.

The experiments suggest that an immunity is established without apparent infection.—NORMAN DOBSON.

GIBBS, C. S. (1934). **Infectious Laryngotracheitis Vaccination.**—*Bull. Mass. agric. exp. Sta.* No. 311. pp. 20. 2 figs., 7 tables. [15 refs.]

This is a continuation of previous work by the author on the immunology of infectious laryngotracheitis. It records laboratory and field experiments on vaccination against this disease by swabbing the groove leading to the bursa of Fabricus with an emulsion of live virus. The success of the vaccination of the flock as a whole depends upon the number of " takes ", which should be 90 to 97 per cent. of the flock. The reactions should be good or excellent, as immunity tends to weaken rapidly in birds showing a poor reaction. The most favourable time for reading the reactions was found to be the fourth or fifth days after vaccination.

A differential study was made of the diseases resembling infectious laryngotracheitis, and it was found that autogenous vaccines for infectious laryngotracheitis, coryza, and rhinosinusitis, were each specific against the infection concerned, but not against the others. It is thus essential that a correct diagnosis be made before vaccinating. Field vaccination was successful in six flocks totalling 11,204 birds. The method of preparing and using the autogenous vaccine for infectious laryngotracheitis is fully described.

Vaccination cannot be depended upon to eliminate carriers and, in the interest of the industry, it should be followed by destruction of all affected birds. Vaccination does, however, enable the farmer to choose the most profitable time for disposal of his flock. Vaccination must under no circumstances be carried out unless the disease is already present on the farm.—R. F. GORDON.

FELDMAN, W. H., & OLSON, C. J., Jr. (1934). **Leukosis of the Common Chicken.** —*J. Amer. vet. med. Ass.* **84.** 488-499. [10 refs.]

Leucosis (leucaemia, or " big liver disease "), one of the most common diseases of fowls, is a fatal blood dyscrasia in which there is severe anaemia with associated leucaemia. The disease can be sub-divided into two types :– (1) myeloid or myeloblastic leucosis, characterized by proliferation of the granuloblastic elements of the bone-marrow, and (2) erythroleucosis, characterized by leucaemia in which there is a predominance of immature erythroblastic cells. Apart from the blood vascular changes, the most characteristic lesions of this disease are hyperplasia of the bone-marrow, liver and spleen.

From present evidence it appears that the disease is caused by a filter-passing agent present in the immature blood cells and, to a less extent, in the blood plasma of affected fowls. The disease is readily transmissible to fowls by inoculation of infective material, but it is doubtful if it is naturally transmissible from bird to bird. The disease shows a relative predilection for individual strains of certain breeds.

The aetiology, classification, symptoms, lesions, pathological histology, blood changes, and diagnosis are described in detail.

In many aspects the disease closely resembles neoplasia and the authors are inclined to believe that it should be classified with this group.—R. F. GORDON.

FOULDS, L. (1934). **The Filterable Tumours of Fowls : a Critical Review.**—*11th Sci. Rep. Imp. Cancer. Res. Fund. Suppl.* pp. 41. 1 table. [7 pp. refs.]

This review is a guide to the extensive literature which has accumulated on the subject of filtrable tumours. Part I deals with the characteristics of the filtrable tumours and their transmission and Part II with the properties of the filtrable agents. The filtrable agents differ from all other tumour agents in their specificity in that they reproduce always and precisely the tumours from which they were obtained and are recoverable in greatly increased amounts from the tumours which they cause.

There are two main views as to the nature of the filtrable agents :– (1) that they closely resemble the filtrable viruses, and (2) that they are products of the tumour cells. The other theories are variations of these two views. The virus theories are supported by the physical properties of the filtrable agents and their capacity for multiplication, but do not account for specificity of filtrable tumours. The virus, however, is not demonstrable in mammalian tumours, and not always in fowl tumours ; this may be due to inhibition or masking of the agent, but there is no positive evidence of its presence. It has been suggested that the virus is a symbiont in normal cells, and that the production of tumours depends, not upon the entry of a virus, but upon the occurrence of local conditions allowing it to operate. Serological investigations give varied results.

The main objection to the theory that the agent is a product of the tumour cells depends upon the failure to identify any known cell product having all the properties of the tumour agents.

The transmission of specific characters of cancer cells to all their progeny has been considered evidence that cancer cells are mutations, and that tumours are produced by mutations of a gene in a normal cell. There is no evidence to prove that genes are filtrable or are capable of producing tumours. Chemical substances can induce the formation of embryonic structures, but do not transmit specific histological characters.—R. F. GORDON.

CLAUDE, A. (1935). **Properties of the Causative Agent of a Chicken Tumor [Rous Sarcoma]. X. Chemical Properties of Chicken Tumor Extracts. XI. Chemical Composition of Purified Chicken Tumor Extracts Containing the Active Principle.**—*J. exp. Med.* **61.** 27-40 and 41-57. 1 fig., 13 tables. [31 refs.]

Paper X gives the results of an investigation into the physical and chemical properties of active chicken tumour extracts and commences with a description of the method employed for the preparation of the extracts. The extract is always a blood-stained and viscous mucoid fluid, the tumour material being largely represented by a mucoprotein. It is shown that this protein material can be very largely removed by a process of adsorption. The extract can be further purified by removing the carbohydrate, chondroitin-sulphuric acid which is present in large amounts, by combining it with gelatine and precipitating the compound at its iso-electric point. During these processes of purification the active tumour principle is not appreciably affected as inoculation of the solution gives as high a percentage of " takes " as the original extract.

Paper XI is a continuation of the investigation outlined in X and consists

of the further purification of chicken tumour extracts by the elimination of inactive products. By a rapid method of dialysis, about 75 per cent. of the remaining solids have been removed without reducing the tumour-producing activity of the extract. By combined fractionation by adsorption and dialyzation, a reduction of 95 per cent. in the total solid content was effected and the tumour-producing property was increased 25 times. An examination of the active residue revealed that about one-fourth of it was a phospholipoid.

The investigations are being continued with a view to identifying the active principle with one of the remaining chemical constituents.—GWILYM O. DAVIES.

MERRILLEES, C. R. (1934). **Psittacosis in Australia.**—*Med. J. Aust.* Sept. 8th. 320-321.

In 1929 a serious outbreak of a disease in budgerigars was investigated. A filtrable virus was demonstrated to be the cause and *post-mortem* findings agreed with those of psittacosis. However, it has been the general opinion that psittacosis does not exist in Australia, and the fact that the virus encountered could not be kept alive in budgerigars for more than two or three generations, and that mice were more susceptible than budgerigars, was at the time thought to preclude a diagnosis of psittacosis. Recent overseas investigations have, however, shown that these findings actually support the diagnosis of psittacosis, so the possibility of this disease being present in Australia must be seriously considered.—W. I. B. B.

PYL, G. (1933). Zur Theorie und Methodik der quantitativen Auswertung filtrierbarer Virusarten. [**Quantitative Evaluation of Filtrable Viruses**].—*Z. Hyg. InfektKr.* **115.** 541-548. 1 table. [5 refs.]

In any quantitative method of measuring virus strength which depends upon dilution methods, attention must be paid to the effect of the diluent upon the particular virus to be studied. A diluent suitable for one virus may be unsuitable for another. This fact is illustrated by an experiment in which normal saline (pH 6·6 to 6·9) and phosphate buffer (pH 7·65) are compared. The virus of foot and mouth disease was rapidly destroyed by saline, the destructive action in this case being a pH effect, whilst in phosphate buffer the virus survived for a considerable number of hours. [Possibly the survival of virus in phosphate buffer was in part due, not to pH concentration, but to the fact that in the buffer solution the mineral constituents were suitably balanced and their toxic effect on the virus correspondingly decreased].—E. J. PULLINGER.

PYL, G. (1934). Vergleichende Untersuchungen über den Realkalisierungseffekt bei Virusarten. [**Effect of Variations in pH on Viability of Viruses**].—*Hoppe-Seyl. Z.* **226.** 18-28. 1 fig., 2 tables. [9 refs.]

The author showed, by means of changing the pH of solutions, that the behaviour of the virus of foot and mouth disease is different from that of vesicular stomatitis, rinderpest or rabies. He found that, whereas the virus of vesicular stomatitis maintained its virulence in alkaline solution, that of foot and mouth disease did not. He concludes that variations in viability, due to changes in pH reaction, must be related to the physical chemical constitution of the virus itself. He suggests that if more work were done on this subject it would not be long before such methods could be used for differential diagnosis in virus diseases.
—JAMES STEWART.

—. (1935). **Virus Carriers.**—*Lancet.* **228.** 388. [1 ref.]

This article refers to the existence of carriers in virus infections. The opinion

is expressed that, in poliomyelitis and encephalitis, the most common transmitter of infection is probably the person suffering from an unrecognized attack, and that there is not as yet a simple laboratory test available for their detection.—T. M. D.

FINDLAY, G. M. (1933). **Experiments on the Transmission of the Virus of Climatic Bubo (Lymphogranuloma Inguinale) to Animals.**—*Trans. R. Soc. trop. Med. Hyg.* **27.** 35-66. 24 figs. on 4 plates, 9 tables, 1 chart. [44 refs.]

The virus was transmitted to monkeys, mice, guinea pigs, rabbits, dogs and voles. By intracerebral inoculation, changes characteristic of a meningo-encephalitis have been produced in all the above species except voles. The author refers to other workers who have infected dogs, but there is no evidence that dogs contract natural infection.—J. E.

INVERTEBRATE VECTORS OF DISEASE.

KUNERT, H., & KRAUSE, M. (1934). Nachtrag zur Arbeit: Findet in Glossina morsitans eine zyklische Entwicklung von Trypanosoma evansi statt? [**Is there a Cyclical Change of** *Tryp. evansi* **in** *Glossina morsitans?*]—*Arch. Schiffs- u. Tropenhyg.* **38.** 534.

In answer to enquiries received as the result of previous work [this *Bull.* **4.** 718.] the authors state that the strain of *Tryp. evansi* used was a young one isolated late in 1932 from a circus camel and kept in mice and guinea pigs until June, 1933, when the experiment was begun; it was thus eight months old.—J. E.

BOUVIER, G. (1934). Note sur les tsé-tsés et les trypanosomes du secteur nord " pastorale ", Katanga. [**Tsetse Flies and Trypanosomes in North Katanga**]. —*Ann. Soc. belge Méd. trop.* **14.** 401-407. 3 tables, 1 map.

The area concerned in this article is infested with tsetse, *Glossina palpalis* being very prevalent and *G. fusca* present in small numbers. Dissection of tsetse flies revealed a gut infection believed to be due to *Tryp. congolense*, the infection rate varying from 7·5 per cent. in one area to nil in other areas. Trypanosomes of the *T. congolense* type were encountered in cattle and horses, but were difficult to transmit to small experimental animals, though in some cases guinea pigs were successfully infected after passage through sheep. The trypanosome is said to yield fairly well to treatment with tartar emetic, but 20 to 40 per cent. of treated animals show relapses.—U. F. RICHARDSON.

MERRILL, M. H., LACAILLADE, C. W., Jr., & TEN BROECK, C. (1934). **Mosquito Transmission of Equine Encephalomyelitis.**—*Science.* **80.** 251-252. [4 refs.]

The authors have shown in repeated tests that *Aedes sollicitans* will transmit both the eastern and western strains of equine encephalomyelitis. Insects receiving a meal of infective guinea pig brain have constantly transmitted infection from the seventh day and onwards. When fed on an infected horse, however, the first positive result was not recorded before the 20th day. *A. cantator* also transmitted the eastern virus but less readily than *A. sollicitans*, while experiments with *Culex pipiens* and *Anopheles quadrimaculatus* were uniformly negative. In order to obtain a reaction, mosquitoes must feed when the virus content of the blood is not less than 0·0001 c.c., i.e. at the height of the febrile response: it is not clear why this is necessary since the virus may multiply from 1,000 to 10,000 times in the body of the insect.

The longest periods over which the virus was recovered from *A. sollicitans*

(transmission by bite) was 33 days for the eastern strain and 63 days for the western strain.—R. E. GLOVER.

NIESCHULZ, O., BEDFORD, G. A. H., & DU TOIT, R. M. (1934). **Results of a Mosquito Survey at Onderstepoort during the Summer 1931-32 in Connection with the Transmission of Horsesickness.**—*Onderstepoort J. vet. Sci.* **3.** 43-77. 8 figs., 3 tables.

This survey was undertaken in order to obtain information as to the mosquito species most probably involved in the transmission of horse-sickness and blue tongue. Tent-like traps with horses as bait animals were used to catch mosquitoes and, as a result, 16 species were encountered. The majority belonged to the *Aedes* and *Culex* species, but there were a few anophelines. *Taeniorhynchus* and *Lutzia* types were very rare. A considerable time was spent in a survey of the breeding places of these mosquitoes. The authors conclude that anophelines may be concerned in the transmission of horse-sickness, but information as to the species could not be obtained and it is unlikely that the malaria carriers are involved as these are house-frequenting mosquitoes. Mosquitoes of the species *Aedes caballus*, *A. lineatopennis* and *A. hirsutus* have breeding habits and a distribution which would fit in with those of the horse-sickness transmitter. The two former are the most probable on account of their association with marshy country ("vleis"). Two mosquito species, *Lutzia tigripes* and *Mucidus scatophagoides*, whose larvae are predatory on other larvae, were encountered.—E. M. ROBINSON.

DISEASES CAUSED BY METAZOAN PARASITES.

I. BARTELS. (1934). Bekämpfung der Dasselplage. Ergebnisse der im Bezirk Schleswig im Jahre 1933 angestellten Versuch. [**Results of Warble Fly Control in Schleswig in 1933**].—*Dtsch. tierärztl. Wschr.* **42.** 1-6. [2 refs.]

II. BARTELS. (1934). Die erstmalige Durchführung des Dasselgesetzes im Regierungsbezirk Schleswig. [**The Initial Work in Schleswig under the Warble Fly Law**].—*Berl. tierärztl. Wschr.* **50.** 817-819.

III. SEELEMANN. (1934). Der Kampf gegen die Dasselfliege in Preussen im Jahre 1934. [**Campaign against Warble Flies in Prussia in 1934**].—*Ibid.* 833-838.

I and II. The treatment of cattle for warbles was put on a compulsory basis in the administrative district of Schleswig for the first time in 1933, " Delicia-Dasselöl " being used in one part and derris in another.

The course of the campaign is described and it was concluded that both preparations were very efficacious, the former being somewhat cheaper but less simple to apply (clip hair and apply to individual warbles), whilst it was difficult to obtain regular supplies of derris with an adequate rotenone content.

On the whole, the year's work was very successful, and a great reduction in the number of warble flies was obtained.

III. A similar report for the whole of Prussia. " Derrilavol " was used almost exclusively, and very good results were obtained. The infestation was only considerable in the more northern part, where the large pasturelands are situated (Schleswig, Hanover, East Prussia, etc.).

A few deaths, apparently from " warble anaphylaxis " were reported from the district of Stade, but this can occur in the absence of treatment. In any case, such losses were insignificant in comparison with the great benefit obtained by the campaign.

The results, however, cannot be conclusively judged until the end of 1935, when reports from tanners have been received. The work must be continued during the next few years.—J. E.

BISHOPP, F. C. (1934). **A Destructive Outbreak of the Screw Worm [Maggot] Fly, *Cochliomyia* ssp., in the Southeast.**—*J. Parasit.* **20.** 337.

The author records a destructive infestation of Georgia, Florida, South Carolina, Alabama, Mississippi and Louisiana with species of flies of the genus *Chrysomyia* [*Cochliomyia*]. Many individual cases of attack were induced in sheep by the primary attacks of the Gulf Coast tick. The situation was aggravated by the movement of freshly branded and ear-marked cattle from drought areas into the infested territory. A control programme, under the direction of the Bureau of Entomology, has given encouraging results.—U. F. RICHARDSON.

MORGAN, D. O., & OLDHAM, J. N. (1934). **Further Observations on the Effect of Heavy Stocking on the Worm Burden under a System of Rotational Grazing.**—*J. Helminth.* **12.** 177-182. [1 ref.]

The most notable observation in the course of this experiment (which, in a large measure, is a repetition of one previously carried out by Morgan) is the surprising difference in the relative frequency of the species of parasitic worms observed in the various individual sheep which were grazed rotationally on the six experimental plots. The large numbers of *Chabertia ovina*, *Trichostrongylus axei*, *Ostertagia circumcincta* and *O. trifurcata*, found in three sheep which died between February 1st and March 15th, show that the cold weather of the winter does not markedly influence their development, and the observation that *C. ovina* and the smaller trichostrongyles tend to be the most prevalent species during the winter months substantiates what was observed in the previous experiment.

—E. L. TAYLOR.

CHEN, H. T. (1934). **Helminths of Dogs in Canton, with a list of those occurring in China.**—*Lingnan Sci. J.* **13.** 75-87. 1 fig., 5 tables. [15 refs.]

Fifty-two dogs were examined and the following parasites found :–

TREMATODES :– *Echinochasmus perfoliatus*, *Clonorchis sinensis*, *Monorchotrema taihoku*, *Metagonimus yokogawa*, *Echinostomum ilocanum*, *Paragonimus* sp. and an unidentified member of the family Lepodermatidae.

CESTODES :– *Dipylidium caninum*, *Taenia crassicollis*, *T. hydatigena* and *Diphyllobothrium mansoni*.

NEMATODES :– *Ancylostoma caninum*, *Toxocara canis*, *Dirofilaria immitis* and *Spirocerca sanguinolenta*.

The incidence of *Clonorchis* infection was found to be as high as 44 per cent.

—E. L. TAYLOR.

PARNELL, I. W. (1934). **Some Methods of Controlling the Spreading of Internal Parasites of the Horse.**—*Sci. Agric.* **15.** 165-168.

One of the most important problems in connection with the control of the parasitic worms of grazing animals is the destruction of the eggs and larvae in manure. Parnell gives a brief account of his observations on the effect of various chemical agents on collections of stable manure and on pastures which have been grazed by horses. Saturating the manure heap with urine, or with a mixture of equal parts of urine and water, kills all infective larvae within 48 hours, and solutions of urea, nitrate of soda, nitrate of potash or sulphate of ammonia are also lethal. 0·5 g. of the dry substance was found to sterilize 40 g. of faeces in 48 hours.

These substances appear to have no effect on pastures, and repeated harrowing is thought to be one of the best measures to adopt, as it rouses the larvae to activity and causes them to use up their food reserve more quickly, so curtailing their possible resting period.

Small amounts of faeces allowed to remain in the stables are thought to be a very important source of infection, and these are best dealt with by disinfectants, for which purpose 5 per cent. lysol or 3 per cent. lye are found to be the most satisfactory.—E. L. TAYLOR.

FISHER, A. C. (1934). **A Study of the Schistosomiasis of the Stanleyville District of the Belgian Congo.**—*Trans. R. Soc. trop. Med. Hyg.* **28.** 277-306. 1 text fig., 6 figs. on 2 plates, 3 tables, 3 graphs. [22 refs.]

The unusual localization of what had been taken for *Schistosoma haematobium* in man led to closer investigations into its specific identity, as a result of which Fisher concluded that a different species, previously unrecognized, is concerned. Specimens were obtained by experimental inoculation of mice and sheep, an account of the findings in these two animals being given in the paper.

The new species, which is named *S. intercalatum* is based principally on the shape of the eggs, this being intermediate between the eggs of *S. haematobium* and *S. bovis*. Treatment with acriflavine gave promising results.—E. L. TAYLOR.

NIELSEN, F. W. (1934). Om Oksetintens Forekomst i Danmark i Tiaaret 1923-32. [**Bovine Cysticercosis in Denmark in 1923 to 1932**].—*Maanedsskr. Dyrlaeg.* **46.** 399-408. 4 tables.

In this article the author publishes the results of a summary of statistics obtained from meat inspectors in 608 local communities, showing the incidence of bovine cysticercosis in the ten years concerned. From the tables, it will appear that the cysts were found on an average in 0·35 per cent. of all the adult bovine carcasses examined, and in 0·03 per cent. of all fat calves. Thus, no noticeable decrease has been recorded in the incidence of the parasite compared with earlier periods. Finally, the author discusses some measures of control which ought to be taken when total eradication of the parasite is the object.—G. N. (FARSUND).

LAPAGE, G. (1935). **The Bearing of the Physiology of Parasitic Nematodes on their Treatment and Control.**—*Imp. Bureau Agric. Parasit.* pp. 21. [16 refs.]

The physiology of nematodes has received very little attention up to the present time, although without some knowledge of the physiological relations of the nematode parasite to its host and to other parasites in the host, we cannot understand the pathology of the diseases which they cause. Nematodes are extremely adaptable, some living a parasitic life, some a free life and some manage to live under both conditions at different stages of their development. Of the several structural peculiarities of nematodes the cuticle is one of the most interesting, and it is very desirable to know something about its permeability as an aid to the search for anthelmintic drugs.

Attempts to kill the eggs of worms are not likely to lead to any economically sound method of control, the problem being apparently too difficult to promise any success at the present time. It may, however, be different where the infective larvae are concerned and substances like bleaching powder which tend to cause the larvae to exsheath may prove of value for applying to infected pasture. Of the nematode's parasitic life we know even less than we do of its free life, and the author's discussion of the problems leads him to the conclusion that a most advantageous line of research in this subject is the attempt to cultivate the adult worms

in vitro. Although their successful cultivation may be very difficult to achieve, the attempt will lead to a further knowledge of their physiology.—E. L. TAYLOR.

TETLEY, J. H. (1934). **The Nematodes of Sheep in Manawatu District, New Zealand.**—*J. Helminth.* **12.** 183-196. [13 refs.]

The indigenous mammalian fauna of New Zealand consists of two species of bat only, and the survey which is here reported is of interest, as it shows the relative success in the colonization of the various introduced parasites. Some hundreds of sheep were examined during the course of the work, but nothing appears to have been encountered by way of helminthic disease. Twenty-five different species were found, all of which occur in Great Britain, with the exception of *Oesophagostomum columbianum*, *Nematodirus abnormalis* and *N. helvetianus*. *N. spathiger* was also found to be of common occurrence. Of the 25 species, the only one requiring an intermediate host (which has also been introduced) is *Muellerius capillaris*. Cattle are considered to be the chief reservoir hosts of the sheep parasite.—E. L. TAYLOR.

I. SCHULZ, R. E. S., MARSCHKINZEW, N. S., GORSCHKOW, I. P., & PETROW, A. M. (1934). **Treatment of Lungworm Disease in Sheep.**—*Sovyet. Vet.* No. 6. pp. 43-46.

II. MURASCHKINZEW, N. S., & KRJUKOW, K. A. (1934). **Mass Treatment of Lungworm Diseases of Calves.**—*Ibid.* pp. 51-55.

III. GORSCHKOW, I. P. (1934). **Treatment of Lungworm Disease of Sheep by Means of a Gas Chamber using Chlorine and Chlorpicrin.**—*Ibid.* pp. 46-51. [Abst. from absts. in *Tierärztl. Rdsch.* **40.** 746-747].

I. The authors report good results in the treatment of parasitic bronchitis in sheep (*Dictyocaulus filaria*) by two intratracheal injections on successive days with a solution composed of iodine one part, potassium iodide 2 parts, distilled water 1,500 parts. The dose for sheep is 15 c.c., for yearling lambs 10 c.c. and for lambs 5 to 8 c.c. The animal is placed on its back with the head uphill and inclining to its right side on one day and to its left side on the second day.

II. Similar results are reported in calves (*D. viviparus*). The dose is 20 to 50 c.c. and an interval of three to five days is allowed between the injections.

III. Good results are reported with the gas treatment of sheep infested with lungworms. The treatment consisted of inhalation in a closed chamber of chlorine in air ranging from a concentration of 1 : 68,000 to 1 : 20,000. The length of treatment was one hour, and it was repeated the next day. The toxic dose of chlorine in air is said to be 1 : 4,000.

Chlorpicrin was also employed in a concentration of 0·24 mg. per litre of air ; 15 minutes inhalation of chlorpicrin produced the same therapeutic results as the double treatment with chlorine, both methods effecting a reduction in infestation of about 75 per cent. The toxic dose of chlorpicrin is given as 0·32 mg. per litre of air.—J. E.

SCHWARTZ, B., & ALICATA, J. E. (1934). **Life History of Lungworms Parasitic in Swine.**—*Tech. Bull. U.S. Dep. Agric.* No. 456. pp. 41. 24 figs., 2 tables. [16 refs.]

This bulletin gives an account of what is known about the life history of the three species of lungworms which infest swine, and is largely concerned with the authors' own observations and experiments. The following species of earthworms were found to serve as intermediate hosts :- *Helodrilus foetidus*, *H. caliginosus* var. *trapezoides*, *Lumbricus terrestris* and a species of *Diplocardia*. Although embryonated

eggs obtained from the gravid uteri of female lungworms usually have a very thin shell and hatch *in vitro*, the eggs which are normally passed by the worms are enclosed in a thick shell, and the larvae do not hatch until the eggs are ingested by earthworms. The migrations and development of the larvae in the earthworm are very carefully traced, but no new fact of any importance is added to previous knowledge on this phase of the life history.

The most marked pathological changes observed to be produced by the developing lungworm larvae in the pig were petechial haemorrhages in the lungs, these being most marked three days after ingestion of the larvae. Portions of the lung in which the worms accumulate later become consolidated, and adjacent areas become emphysematous. The most outstanding symptom observed during the course of the lungworm infestation was a cough. *Metastrongylus elongatus* and *Choerostrongylus pudendodectus* were found to develop to maturity in guinea pigs and dogs, but the eggs which were recovered from the uteri of some of the female worms taken from these experimental hosts were found to be incapable of infecting earthworms.—E. L. TAYLOR.

YAMADA, A., & INOUYE, K. (1934). **Nourishment of Anchylostoma caninum and the Histological Changes of Intestine thereby Produced.**—*J. orient. Med.* **20.** No. 4. [In Japanese : abst. from English summary. pp. 52-53].

A careful histological examination was made of seven female and nine male *A. caninum* attached to the wall of the intestine, and it was observed that the mucous membrane becomes drawn into the mouth capsule of the worm ; the epithelial covering of this portion is usually removed by some digesting action on the part of the worm, portions being observed in various stages of digestion in the worms' intestines. Red and white corpuscles observed in the worms' intestines appeared to be quite unaffected and were expelled unchanged from the anus.

In addition to the mechanical injury caused by the worms, intestinal glands of the host were noticed to have become atrophied and a cellular infiltration of the intestinal wall was present. It is considered that some toxin produced by the worms must have been responsible for these changes.—E. L. TAYLOR.

ORTLEPP, R. J. (1934). **Preliminary Note on the Life-History of** *Gaigeria pachyscelis* **(Raill. and Henry, 1910), a Hookworm of Sheep.**—*Onderstepoort J. vet. Sci.* **3.** 347-349.

Investigations were made into the method by which sheep become infected with *G. pachyscelis*, a nematode of common occurrence in the arid parts of South Africa. Experimentally, it was only found possible to infect sheep by placing larvae on the skin.—E. M. ROBINSON.

ISSHIKI, O. (1934). *Haemonchus similis* **Travassos, 1914 in Korean Calves.**—*9th Rep. Govt. Inst. vet. Res. Fusan, Japan.* Pt. I. pp. 118-125. 1 plate, 8 tables. [5 refs.] [In Japanese : abst. from English summary. Pt. II. p. 13].

This parasite has previously been reported from South America, Europe and India. Isshiki found it in 22 per cent. of 300 Korean calves. He adds one or two particulars of morphology to those previously described by TRAVASSOS and by BHALERAO, and divides the individuals which he examined into three types.

—E. L. TAYLOR.

DE JESUS, Z. (1934). **Haemorrhagic Filariasis in Cattle caused by a New Species of Parafilaria.**—*Philipp. J. Sci.* **55.** 125-131. 1 text fig., 2 figs. on 1 plate, 2 tables. [5 refs.]

de Jesus describes the occurrence of a condition in cattle simulating the "blood boils" caused by a filarial worm *Parafilaria multipapillosa* in horses and mules in the far East. The lesions appear on various parts of the body and are at first painless, but later, when bleeding begins (early in December), they increase in size and become painful to the touch. The nodules attain a maximum diameter of 40 mm. and a thickness of 10 mm. and usually remain until July, but occasionally may be seen on the cattle up to September. On examination these lesions are found to contain a female worm which, de Jesus considers, belongs to a new species of *Parafilaria*. [The new name *Parafilaria bovicola* is used, but no description is given].—E. L. TAYLOR.

FRIEDLANDER, R. D. (1934). **The Present Status of the Diagnostic Intradermal Test for Human Trichiniasis.**—*Amer. J. Med. Sci.* **188.** 121-123. [5 refs.] [Abst. from abst. in *Trop. Dis. Bull.* **31.** 802].

In the author's opinion the intradermal test for human trichiniasis is reliable, although the preparation of the antigen is difficult.—J. E.

IMMUNITY.

MOOSBRUGGER, G. A. (1934). Etat actuel des théories sur l'immunité. **[Theories on Immunity].**—*Schweiz. Arch. Tierheilk.* **76.** 255-266 and 298-310. [1 ref.]

The data upon which present-day theories of immunity are based are recorded under the usual headings of natural and acquired immunity, cellular and humoral defences of the animal host and the study of antigens. No new facts or unorthodox interpretations of facts are advanced.—E. J. PULLINGER.

BUTTLE, G. A. H. (1934). **Attempts to Locate the Site of Antibody Production.**—*Brit. J. exp. Path.* **15.** 64-70. 4 figs. [6 refs.]

As the result of experiments on rabbits, the author concludes that neither the blood, liver, spleen nor skin is predominantly responsible for the production of antibodies, and suggests that all tissues play a part.

In the experiments, diphtheria toxoid was used, owing to the pronounced and rapid response to the secondary stimulus shown by animals so injected, and because of the greater accuracy with which diphtheria antitoxin can be titrated.

For the primary stimulus, 2 per cent. alum was added to the toxoid, a more uniform response being thus obtained than with plain toxoid. The author notes that the response to the secondary stimulus is greater when an interval of three to four months is allowed to elapse between it and the primary stimulus.—N. B.

WEBSTER, L. T. (1933). **Inherited and Acquired Factors in Resistance to Infection. II. A Comparison of Mice Inherently Resistant or Susceptible to Bacillus enteritidis Infection with Respect to Fertility, Weight, and Susceptibility to Various Routes and Types of Infection.**—*J. exp. Med.* **57.** 819-843. 6 text figs., 7 tables. [10 refs.]

In a previous paper [(1933). *J. exp. Med.* **57.** 793.] by the same author, selective breeding experiments on mice were described, in which, from a stock that was 37·4 per cent. susceptible to *Salmonella enteritidis* (formerly *Bact. enteritidis* Gärtner), certain mice were developed that were approximately 85 and 15 per cent. susceptible. This paper deals with the questions of whether this resistance is correlated to body vigour, whether it is localized at the portal of entry or is general, and whether it is resistant to a single micro-organism or to a number of harmful agents.

The resistant and susceptible mice were compared as regards sex ratio, fertility and weight. The data indicated that resistance and susceptibility in mice were not noticeably correlated with presence or lack of bodily vigour.

The tissues of susceptible mice, not only at the surface, but throughout the body (as shown by subcutaneous, intraperitoneal, and intravenous inoculations), appeared more susceptible to *S. enteritidis* than those of resistant mice. This suggested general rather than local influence of the inherent factor.

Mice susceptible to *S. enteritidis* were likewise susceptible to *Pasteurella aviseptica*, Friedländer's bacillus and the pneumococcus. Lines of mice resistant to *S. enteritidis* were resistant to the same three organisms. Of the four lines of mice susceptible to *S. enteritidis*, two were susceptible to the virus of " louping ill " and two fairly resistant, while lines resistant to *S. enteritidis* proved relatively susceptible to the virus infection. This indicated that inherited resistance can operate against a number of, but not all, harmful agents.—R. F. Gordon.

Ramon, G., & Lemétayer, E. (1934). Sur l'immunité antitétanique naturellement acquise chez quelques espèces de ruminants. [**Naturally Acquired Antitetanic Immunity in Ruminants**].—*C. R. Soc. Biol. Paris.* **116.** 275-277. 1 table. [6 refs.]

The authors have previously noted the possession by cattle, sheep and goats in France of a naturally acquired immunity to tetanus, and the absence of such immunity in human beings, horses, pigs and dogs. They suggest that this immunity may be exclusive to ruminants, and that the " gastric reservoirs " may play an important role in its production.

In support of their theory they report on the presence of tetanus antitoxin in the sera of cattle, camels, dromedaries, buffaloes and zebus, in Asia and Africa. They note that the amount of antitoxin present in each case is in direct proportion to the prevalence of *Clostridium tetani* in the soil.—Norman Bisset.

Selter, H., Fetzer, H., & Weiland, P. (1934). Entstehung der Tuberkuloseimmunität beim Meerschweinchen. [**Development of Immunity to Tuberculosis in the Guinea Pig**].—*Z. ges. exp. Med.* **93.** 34-44. 3 tables. [6 refs.]

Selter, H., Fetzer, H., & Weiland, P. (1934). Ueber Umfang und Leistungsfähigkeit der Tuberkuloseimmunität beim Meerschweinchen. [**Immunity to Tuberculosis in Guinea Pigs**].—*Ibid.* 45-61. [6 refs.]

In the first article the authors detail a comparison of the relative safety and protective power of BCG and a weakly virulent human strain of *Mycobact. tuberculosis*, designated EM, when injected subcutaneously. They conclude that the strain EM, whilst producing a more severe reaction than BCG with some spread but not generalization within the seven month period of observation, thereby confers a higher and more durable protection against a test dose of virulent organisms. They believe that the protection conferred by BCG fades and disappears as soon as the local lesion goes.

In their main experiments, detailed in the second article, they have therefore used the strain EM. Previous treatment with this in a dose of 1/3,000th mg. subcutaneously protected guinea pigs against subcutaneous or intraperitoneal injection of doses of a virulent strain which were fatal to controls ; the result was the same whether the test dose was given four weeks or four and a half months after the protective inoculation, and a second test dose was also withstood. Resistance to an intravenous test dose was less marked but the course and degree of spread into the body was definitely modified. Immunized guinea pigs withstood well even large doses, up to one million infective doses, of the test culture when that was given intraperitoneally.

Continued inhalation of silicic acid had no influence on the immunity. Inhalation of powdered quartz sand helped to break down the immunity in some cases. Chronic carbon-monoxide poisoning appeared to have no effect on the immunity.
—A. W. STABLEFORTH.

RICE, Christine E. (1935). **Development of Precipitins for Protein, Lipoid and Carbohydrate Fractions of S and R Forms of Tubercle Bacilli.**—*J. Immunol.* **28.** 19-30. 4 tables. [40 refs.]

It has been shown previously [this *Bull.* **1.** 189., **2.** 133., **4.** 205., and **5.** 362.] that rabbits inoculated with S and R variants of *Mycobact. tuberculosis* react differently when tested by the complement-fixation test with aqueous extracts prepared from cultures of the two colonial types. In the present paper it is shown that precipitation tests indicate small differences in the protein and carbohydrate substances in S and R types although both chemical groups have common fractions. On the other hand, similar tests with lipoid fractions show no type specificity.

Tests with partially purified proteins and the purified albumin and globulin from S organisms suggest that the globulin fraction may bear some relation to S specificity.—R. LOVELL.

FELDMAN, W. H. (1934). **The Use of Different Concentrations of Tuberculin in the Diagnosis of Tuberculosis of Chickens.**—*J. Amer. vet. med. Ass.* **84.** 889-894. 2 tables. [2 refs.]

A batch of 19 tuberculin-positive chickens obtained from infected flocks was tested at regular intervals of four to five weeks with " old tuberculin " (a) undiluted, and (b) diluted 1 : 100. In most instances the two tuberculins were administered simultaneously, one wattle being used for each preparation. In general, the reactions elicited by the diluted tuberculin were much less marked than those resulting from the standard product : in addition, the magnitude and intensity of the reactions to both tuberculins steadily diminished with successive tests until some of the chickens became tuberculin-negative. At autopsy, eight chickens showed visible lesions of tuberculosis but 11, which were positive to the initial test, failed to reveal either macroscopic or microscopic lesions. This observation suggests a problem similar to the bovine no-lesion reactor.

The two tuberculins were also applied under field conditions and data obtained from 266 birds. In this group, 60 (approximately 23 per cent.) reacted to undiluted " old tuberculin ", but only 36 to the diluted preparation.—R. E. G.

FRAPPIER, A., & FREDETTE, V. (1935). **Some Observations on the Allergy to Tuberculin of Guinea Pigs Vaccinated with B.C.G.**—*Canad. J. Res.* **12.** 165-176. 10 figs., 3 tables. [31 refs.]

The authors show that the development of allergy in guinea pigs vaccinated with BCG (0·0025, 0·005 or 0·01 g.) is relatively slow and varies with individuals.

They estimated the degree of skin sensitivity by serial intradermal tests with decreasing doses of tuberculin. Classification of this reaction by large doses of tuberculin is unreliable and an early reaction after vaccination is not indicative of lasting hypersensitiveness. Smaller doses of tuberculin differentiate the degree of allergy better than a large dose (tested simultaneously).

If vaccinated subcutaneously, most guinea pigs developed allergy in five to 20 days, with a maximum in about one to two months. Many of these more sensitive animals reacted to a reduced dose of 0·00001 c.c. during the third and fourth months and perhaps later. A few were sensitive to 0·000005 c.c. in the fourth month.

As regards subcutaneous vaccination, the degree of allergy did not seem influenced by the small variations in the dose of BCG but, when vaccinated intraperitoneally, the larger doses produced greater sensitization, as determined by the smaller doses of tuberculin.—C. V. WATKINS.

I. WEIR, J. (1935). **Remarks on the Double Intradermal Tuberculin Test.**—*Vet. Rec.* **15.** 1-4.
II. WATERS, W. (1935). **The Double Intradermal Test [Correspondence].**—*Ibid.* 73.
III. WEIR, J. (1935). **The Double Intradermal Tuberculin Test [Correspondence].**—*Ibid.* 151.
IV. WATSON, H. C. (1935). **The Double Intradermal Tuberculin Test [Correspondence].**—*Ibid.* 281.

I. Preparation of the site is unnecessary except to clip a small area for easy identification ; disinfection is contraindicated since oedema may be caused. Measuring the skin is not recommended. Injection should be made into the deeper layers of the skin, and can be checked by the swelling which quickly follows and the small pin-point of coagulum which is present 48 hours later. Doubtful reactions may be due to :– (1) injecting too deeply, when the swelling may reach one inch in diameter, but be hard and circumscribed, or the tuberculin may run and the swelling become long with ill-defined edges ; in both cases pain is absent ; (2) superficial injections, causing in reactors a large, circumscribed painful nodule which is unattached to the underlying skin – this is also noted in skin which is hide-bound ; (3) if the animal rubs the site, enlargement and slight pain are caused ; reactors do not rub owing to pain, or (4) non-specific reactions which decrease after the 48th hour.

REACTIONS.—Swellings should be judged by their nature, not by size. If attached to underlying tissues, they always denote a reactor. Pain is a most prominent sign of reaction. Non-specific reactions are diffuse and oedematous, but the oedema is less turgid than in a true reactor, and a pea-like nodule may often be felt in the centre. A negative nodule may have a non-specific dependant oedematous swelling. Suggested modifications are :– a single injection only, to be read at the 72nd hour ; use of the intrapalpebral test as a control, when necessary ; this is considered the most reliable of all the tuberculin tests and is read at the 24th hour.

II. The author refers to his criticism of the intradermal test [this *Bull.* **4.** 755.], describing three reactors which revealed no lesions at *post-mortem* examination.

III. It is common to find animals that pass the test but which, if exposed to infection, react later and infect others. No-lesion reactors are to be expected in herds tested every six months, since the lesions may not have had time to develop.

IV. Watson agrees with WEIR'S suggested modification of the test by use of a single injection. The test has proved very reliable in a herd of over 1,000 cows in Hong Kong, where it has been carried out every six months for ten years. Cows are retained in the herd till they are slaughtered or die, when a *post-mortem* examination is carried out.—H. E. BYWATER.

MACHEBOEUF, M. A., LÉVY, Georgette, & CHAMBAZ, M. (1934). Etudes sur les antigènes fixateurs des bacilles tuberculeux. (Premier mémoire). Antigènes fixateurs contenus dans les substances lipoidiques extraites de bacilles tués par la chaleur. **[Complement-Fixing Antigens of *Mycobact. tuberculosis* Contained in the Lipoid Substances Extracted from Heat-Killed Bacteria].** —*Ann. Inst. Pasteur.* **53.** 591-597. [7 refs.]

The authors attempted to discover which of the lipoid substances present in *M. tuberculosis* were capable of fixing complement in the presence of specific serum obtained from a horse injected with living organisms of the BCG strain, and to obtain some knowledge of their chemical composition. Various extracts were made and only in two was any appreciable complement-fixing ability found. In both cases this was due to the presence of a substance common to both [soluble in chloroform and cold alcohol but only sparingly soluble in acetone].

Whilst all the active extracts were found to contain phosphorus, some that were rich in this element gave negative results.—J. E. WILSON.

RIEDMULLER, L. (1934). Ergebnisse der Milchschnell- und Milchserumlangsam-agglutination auf Bang. [**Slow and Rapid Whey Agglutination Tests for** *Brucella abortus*].—*Schweiz. Arch. Tierheilk.* **76.** 279-286. 10 figs., 2 tables. [15 refs.]

Details of the technique used in the ordinary agglutination test are recorded. A rapid test is also described. In the latter, a 48-hour-old carbolized suspension of *Br. abortus* is used as an antigen. The test is carried out on a slip of glass lying upon a black shiny background of celluloid. One to two drops of suspension are mixed with an equal amount of whey. The test is read five minutes later. Photographs are reproduced which illustrate the reading of the results. The rapid test usually gave positive readings in samples having a titre of 1 : 10 and upwards, as measured by the tube test. Out of 469 samples, in 13 instances the rapid test failed to pick out samples having a titre of 1 : 10 or 1 : 20.—E. J. PULLINGER.

SARNOWIEC, W. (1934). Phénomène de zone dans l'agglutination par le sérum des cobayes tuberculeux traités par *Brucella abortus*. [**Zone Phenomenon in Agglutination by Serum of Tuberculous Guinea Pigs Treated with** *Br. abortus*].—*C. R. Soc. Biol. Paris.* **116.** 829-831. [1 ref.]

By inoculating guinea pigs, which had been infected with tubercle bacilli for some weeks, with suspensions of either living or dead *Br. abortus*, rather higher blood agglutinin titres were obtained as compared with the results in non-tuberculous control animals. Zones, in which no agglutination appeared, were seen in the blood of all tuberculous guinea pigs, somewhere between the titres of 1 : 30 and 1 : 100. Such zones were not seen in control animals. These experiments are claimed to support the theory that tubercle infection causes a state of the host favourable to extensive antibody production.—E. J. PULLINGER.

VALCARENGHI, E. (1934). Agglutinines spécifiques chez les veaux inoculés avec Brucella abortus Bang. [**Specific Agglutinins in Calves Inoculated with** *Br. abortus*].—*Bull. Acad. vét. Fr.* **7.** 385-389. [9 refs.]

Valcarenghi suggests that there is considerable room for improvement in the serological method of diagnosis of bovine contagious abortion. It has been shown that even in calves experimental infection *per os* has not always stimulated a subsequent agglutination reaction. The method of infection may be more important than the age of the animal or type of antigen used. Experiments with the intravenous method of infection in calves of varying ages has led the author to affirm strongly that, even in very young calves, specific antibodies can be demonstrated in this way. It is suggested that in contagious abortion age is of no consequence in the production of agglutinins in comparison with the method of infection.
—A. L. MULLEN.

SCHNÜRER, J. (1935). Blutschnellagglutination bei Malleus. [**Rapid Blood Agglutination Test for Glanders**].—*Wien. tierärztl. Mschr.* **22.** 23.

The authors describe a rapid slide agglutination test for glanders, using drops of bacterial suspension, and preparing serum dilutions by adding a drop of strong serum to the first drop of suspension, and then passing a drop of this mixture to the next drop of suspension. Suitable positive and negative controls are also included. [In view of the high " normal agglutinin " titre of non-infected horses to *Pfeifferella mallei* reported by LOVELL [this *Bull.* **5.** 436.], it is doubtful if a test of this nature would be of value, except where the agglutinin titre is very high].
—E. J. PULLINGER.

DISEASES, GENERAL.

BISBOCCI, G. (1934). Contributo alla conoscenza delle alterazioni anatomiche da febre catarrale maligna nei bovini. [**Pathology of Malignant Bovine Catarrh**].—*Nuovo Ercol.* **39.** 281-297. 4 figs. [55 refs.]

The author has examined material from five typical and atypical cases of bovine malignant catarrh. The tissues were fixed and stained by the usual methods and particular attention was paid to the central nervous system and kidneys. In each case, the author observed masses of cells consisting chiefly of lymphocytes between the arachnoid and pia mater, perivascular infiltration in various lobes of the cerebrum, the cells being lymphocytes and small plasma cells, and areas of degeneration and necrosis in the stratum lucidum and other parts of the brain. In the kidneys, a well-marked connective tissue reaction, hyperaemia and shrinking of the glomeruli were always seen. Areas of infiltration in the neighbourhood of the glomeruli and desquamating cells in the capsular space were common. Stomatitis with the formation of vesicles does occur although it is rapidly masked by the supervening necrosis. The most important diagnostic lesions are a non-purulent encephalitis and acute interstitial nephritis. Transmission experiments, using emulsions of brain, aqueous humour and blood, were carried out but only those rabbits which had received brain emulsion became affected and died within two days.—J. A. NICHOLSON.

SMITH, R. M. (1934). **White Scour and Allied Diseases in Calves.**—*Vet. Rec.* **14.** 1004-1016. [7 refs.]

The author circulated a questionnaire among a number of farmers and received 52 tabulated replies, from which he was able to form statistics showing that the mortality in calves is seasonal and occurs mainly in the spring months, tends to disappear during the grazing period and returns in a milder form in the autumn. Evidence is given which correlates white scour, navel ill, joint ill and septic pneumonia and *post-mortem* examination proved that one or more of these diseases may co-exist. Sanitary conditions of the environment do not appear to have any bearing on these diseases. It is suggested that research in the matter is more a problem of bacteriology than of dietetics.—JOHN REID.

—. (1934). **Control of Calf Diseases.**—*Sovyet Vet.* No. 11. pp. 90-94. [Abst. from French summary].

Describes sanitary measures to be adopted.—C. V. WATKINS.

TSELIK, W. Z. (1934). **Sweet Clover Disease in Cattle.**—*Sovyet Vet.* No. 11. pp. 64-66. [Abst. from French summary].

Mouldy clover hay and silage cause a haemorrhagic disease in cattle and, very rarely, in sheep. Affected animals show disordered locomotion and may be

definitely lame. Blisters form under the skin, especially that of the neck and along the back. Sometimes a bloody nasal discharge occurs. Occasionally the temperature is sub-normal, and blood may appear in the milk. Autopsy shows ecchymoses in varying situations, but principally between the fibres of thick muscles, with blood clots which may weigh 10 lb. ; blood extravasation occurs in the heart muscle and spinal cord and, rarely, in the brain.

Such food should be withheld, and sick animals treated by transfusion of defibrinated blood.—C. V. WATKINS.

UBERTINI, B. (1934). Aspetti della sterilità bovina in provincia di Brescia ; l'aborto precoce. [**Sterility and Abortion in Cattle**].—*Clin. vet., Milano.* **57.** 169-186. [25 refs.]

During recent years, the incidence of sporadic abortion amongst cows has increased in the province of Brescia, and on careful examination the outbreaks are suggestive of an infectious disease. The disease is more common in the spring and is characterized by a mucopurulent vaginal discharge, abortion and the rapid onset of oestrum. Affected animals usually belong to the same locality and have been served by the same bull. Agglutination tests have shown that the cause is not *Brucella abortus*. In the majority of cases, the uterine discharge is odourless, bacilli are absent but pure cultures of *Trichomonas* can be isolated. This protozoan organism was also isolated from every foetus examined. Occasionally samples of thick, evil-smelling pus were obtained from the uterus ; these contained *Corynebact. pyogenes*.

Conception usually occurs without trouble, but a few cows although coming on heat remain sterile on account of a chronic endometritis which will not yield to treatment.—J. A. NICHOLSON.

SLAGSVOLD, L., & LUND-LARSEN, H. (1934). Myosit hos lam, kalver og ungfe. [**Myositis in Lambs, Calves and Heifers**].—*Norsk. VetTidskr.* **46.** 529-552. 7 figs. on 4 plates, 3 tables. [23 refs.]

In this article the authors publish their investigations into a peculiar disease of young lambs and calves occurring in certain areas of the inland and higher parts of Norway. The disease passes under different names locally, but all indicate the chief symptoms, disorders of movement and muscular pain. Affected animals may be seen during the season when the animals fed are indoors, but most of the cases occur in the spring, a few days after they are let out on to grass for the first time.

The chief lesions are found in parts of a muscle, or in muscle groups, including the heart. Oedema and capillary bleeding are the most striking features in acute cases. In more chronic cases the muscle fibres have been subjected to degenerative changes having some similarity to hyalin degeneration, but differing from this by more pronounced tendency to deposition of calcium compounds. No specific organism or condition has been demonstrable as the cause. Under farm conditions, and experimentally, the supply of adequate rations of minerals and vitamins to the pregnant dams has proved to be of preventive value. Finally, a review is given of the literature on diseases characterized by degenerative changes of the muscular apparatus.—GUSTAV NAERLAND (FARSUND).

HEARLE, E. (1933). **Notes on a Serious Outbreak of Tick Paralysis in Cattle.**—*Proc. ent. Soc. B.C.* No. 30. pp. 11-16.

In cattle, wholesale outbreaks of tick paralysis are extremely rare. The reported outbreak occurred in 1930 at Nicola, British Columbia. During the

first week in April, 900 yearling steers were turned out. A few days later about 100 developed paralysis which chiefly affected the forelegs and 65 ultimately died. Ticks, *Dermacentor andersoni*, were found attached and, in severe cases, numbered up to 150. The pastures were changed and treatment was adopted, by hand picking in the more severe cases and with a dressing composed of 4 gall. coal oil, 10 lb. lard and 2 lb. sulphur applied to the back of the head and along the neck, shoulders and backbone. The above mixture caused blistering, and raw linseed oil or cottonseed oil with oil of pine tar was substituted and proved successful. The onset of cold weather decreased the incidence of new cases of paralysis. Cattle grazing above 3,000 feet were almost free from infection.

Secondary injury resulted from severe infestation of the tick bites with maggots of the blowfly *Phormia regina*. It was recommended that dead carcasses should be soaked with creosote oil to reduce fly breeding where the carcasses could not be burned or buried.—C. R. Turbet.

Grzycki, S. (1934). Ueber das Wesen und die Therapie der Haemoglobinuria paralytica beim Pferde. **[The Nature and Treatment of Myoglobinuria Paralytica in the Horse].**—*Berl. tierärztl. Wschr.* **50.** 789-790.

The author made a detailed chemical analysis of the contents of the blood and muscle of two animals suffering from myoglobinuria paralytica. [On account of the small number of animals examined any general statement is not permissible but the results obtained were very striking]. In the blood of affected animals, as compared with that of normal subjects, the total blood sugar, phosphorus, creatinine and lactic acid were considerably in excess, and in muscle the total phosphorus was deficient ; the lactic acid content varied but slightly, and there was a drop of 50 per cent. in the phosphagen content.

In discussing his results the author considers that these indicate a disturbance of the normal process of glycolysis.

Adopting a purely empirical line of treatment, 200 units of insulin were injected intravenously and within 12 hours the various constituents of the blood were restored to normal.—N. S. Barron.

—. (1934). **Discussion on the Results of Suturing Divided Nerves, with Special Reference to the Treatment of Laryngeal Paralysis in Horses.**—*Proc. R. Soc. Med.* **27.** 1207-1210. [5 refs.]

The title is incomplete as other subjects besides laryngeal paralysis in horses are dealt with.

The discussion opens with an account by Sir Charles Ballance of the development of an operative treatment for paralysis of the vocal cord and of the face in man, as an introduction to the possibility of applying similar operative measures in the relief of allied conditions in the horse. The operative treatment under consideration is that of nerve union, not nerve anastomosis.

In reference to roaring in the horse the experimental findings were described by Lt. Col. Argyle who considered that they indicated clearly that the phrenic is the ideal nerve for union with the affected recurrent laryngeal. The necessity for early diagnosis and immediate operation is emphasized, i.e., before anchylosis of the small joints of the larynx has set in or degenerative changes in the laryngeal muscles and left recurrent laryngeal nerve have advanced too far.

There is a description of the pathological changes associated with roaring and a short review of the theories of causation of the disease.

The operative methods for the relief of facial palsy in man are also described and the possibility of applying similar measures in facial paralysis in the horse considered.

The discussion ends with an account by Major GLYN LLOYD of the value of the rhino-laryngoscope as a means of determining the degree of paralysis existing in the vocal cords of horses which are roarers.—C. DAVENPORT.

FRAUCHIGER, E. (1933-34). Ueber den Dummkoller des Pferdes. [**"Dummkoller" (Sleepy Staggers, Hydrocephalus) of the Horse**].—*Schweiz. Arch. Tierheilk.* **75.** 591-604 and **76.** 13-26, 72-84 and 109-129. 13 figs. [95 refs.]

This is a full and detailed discussion of this so-called " Dummkoller " or " sleepy staggers " in horses with particular reference to the pathogenesis and to the part played by hydrocephalus in the production of the condition. There can be no doubt that the clinical syndrome referred to by the above names must often be caused by totally different diseases of the brain. The differentiation of the various forms of diseases of the central nervous system in animals has only been developed within recent years and as a result many of the explanations regarding the pathology and genesis of this " Dummkoller " which were propounded many years ago have been accepted generally although not fully proved. The idea that a hydrocephalus was generally responsible for the condition and the suggested explanation concerning the mechanism of its production is mainly due to DEXLER, who contended in his early work that the disease was a true acquired internal hydrocephalus which could be produced by pressure of tumours, etc. on certain parts of the ventricular system of the brain. Later the same author revised his opinion and stated that it might be caused by swelling of the occipital lobe of the brain and by pressure of this against the osseous tentorium, resulting in blockage of the venous drainage particularly of the great vein of Galen.

There is a general discussion of the mechanism of production and direction of flow of the cerebrospinal fluid and how various factors will result in increased or decreased flow and dilatation of the lateral ventricles. Controversy has continued over these various points for years without any definite agreement being reached. One point does appear to emerge, namely, that blockage of the aqueductus Sylvii does not always cause hydrocephalus of the lateral ventricles, an idea first propounded by DANDY who carried out experiments on dogs for this purpose.

The author examined the brains of nine horses which had suffered from what was diagnosed clinically as " Dummkoller ". In none of these was there any distinct evidence of a true hydrocephalus even after careful measurement of the ventricles and comparison with normal standards. In fact, these nine cases included one case of cerebral haemorrhage, one of meningitis, one of cerebral abscess, and three of cholesteatomata. The author concludes that, from his series of cases, the outstanding feature is a swelling of the occipital lobes of the cerebrum. The article should be read in the original.—J. R. M. INNES.

LÁSZLÓ, F. (1934). Beiträge zur pathologischen Anatomie und Histologie der Zirbel. [**Diseases of the Pineal Body of the Horse**].—*Dtsch. tierärztl. Wschr.* **42.** 685-689. 12 figs.

After reviewing the anatomy and histology of the normal pineal gland of the horse, László gives the results of the examination of 151 glands, viz. :– there are no differences in the structure of the pineal bodies of foals and old horses ; there is no concretion in the pineal gland of the horse ; there is no homogenous material in the nuclei of pineal cells, and thus no nuclear secretion, and involution changes are not demonstrable.

The pathological changes encountered were :– (a) formatio reticularis (reduction in cellular elements and increase in connective tissue) ; (b) hyperaemia ; (c) petechiae ; (d) haemosiderosis ; (e) induration ; (f) perivasculitis ; (g) hyaline

degeneration ; (h) calcification ; (i) cellular necrosis, and (j) cystic degeneration. —A. W. N. PILLERS.

GLÄSSER. (1934). Zum Tierschutz und zur Krankheitsvorbeuge bei Schweinen. **[Prevention of Swine Diseases].**—*Berl. tierärztl. Wschr.* **50.** 792-796.

This article follows general lines in advocating a series of measures which would prevent losses which, although not caused by contagious disease, are nevertheless serious. Exposure to sun, fresh air, good dry housing protected from adverse weather, and a sound diet of cereals and green food are strongly recommended. In transit there are injuries, exposure to extremes of temperature, and long debilitating journeys. There should be no unnecessary suffering and veterinary inspection is called for.—A. W. N. PILLERS.

MARCELLUS, F. N., MAW, W. A., & BONYMAN, E. D. (1934). **Report of the Poultry Committee. Canadian Society of Animal Production – Eastern Section.**—*Sci. Agric.* **15.** 181-188.

This report covers the whole field of poultry husbandry in sections dealing with breeding, nutrition, etc.

In the section dealing with disease control, mention is made of vaccination in fowl pox and fowl cholera, and of the use of serological and skin tests in the control of *Salmonella* (formerly *Bact.*) *pullorum* infection and tuberculosis.—W. J. I.

BACHMANN, W. (1934). Mareksche Huhnerlähme auch in der Schweiz. **[Marek's Fowl Paralysis in Switzerland].**—*Schweiz. Arch. Tierheilk.* **76.** 286-295. 4 figs. [12 refs.]

Some of the literature dealing with the subject is discussed and four cases of paralysis are described in which there was doubt as to whether symptoms were due to specific infection or to parasitic infestation. Diagnosis is based largely upon the pathological anatomy. Changes include thickening of the peripheral nerves and yellow or grey discoloration of the swellings. [For further details see this *Bull.* **4.** 533 and 624]. Control measures include removal of diseased birds, whilst eggs from infected birds should not be used for breeding. New stock should only be introduced from farms known to be free from the disease.—E. J. PULLINGER.

MILBY, T. T. (1934). **Factors Influencing a Malformation of the Leg Bones of Growing Chickens.**—*Bull. Ia. agric. Exp. Sta.* No. 172. pp. 225-252. 3 figs., 17 tables. [28 refs.]

This malformation of the leg bones of chickens known as " slipped tendon ", " hock disease ", " perosis ", or " deforming leg weakness " has become a problem of major importance with the development of intensive brooding conditions. In view of the confusion as to the symptoms which should be included in this disorder, the author presents a brief description of the abnormalities observed, and a review of the literature on the subject.

The experiments described show that, with rations otherwise adequate for normal growth and in which the amount of calcium was held practically constant, excess phosphorus appears to be the chief causative factor in the production of " slipped tendon ". The percentage of ash in the dry fat-free leg bones of chicks affected with " slipped tendon " was not significantly different from that of the leg bones of normal chicks on a control ration. A ration containing 3 per cent. magnesium carbonate did not lead to the development of either " slipped tendon " or bending of the leg bones, but growth was low. Rice bran and, to a lesser extent, wheat middlings appear to contain a substance which tends to prevent " slipped tendon ".—R. F. GORDON.

JUNGHERR, E. (1934). **Primary Mesothelioblastoma of the Bovine Omentum [Heifer].**—*J. Amer. vet. med. Ass.* **87.** 907-914. 7 figs. [10 refs.]

This is a case report of a tumour of the omentum in a 14-month-old heifer. The parietal surface of the membrane was covered with small multiple growths, and the cells present were concluded to bear some resemblance to those which cover serous membranes termed by some histologists as mesothelium. The author therefore classifies the tumour as a mesothelioblastoma. Growths were observed in the lungs which were considered to be metastases.

[The term mesothelioma was first given to tumours of the adrenal cortex and in the literature it has been the custom to apply the name endothelioma to tumours of the type now recorded. However, while the possibility that primary tumours of coelomic membranes do occur cannot be denied, the large majority of cases of serosal disease are undoubtedly secondary to some undiscovered primary tumour in the neighbouring viscera. The diagnosis of primary serosal tumours is often made on wholly inadequate grounds and with insufficient appreciation of the frequency with which small primary carcinomata yield massive and widespread metastases. Before a diagnosis of such can be accepted, a painstaking search must be made of viscera to exclude this possibility and mention should be made of this in the report. Apart from this point the classification of tumours under such names as endotheliomata or mesothelioma appears to be unnecessary as it has been stressed by numerous authorities that such tumours differ neither in behaviour nor structure from the well-known serosal carcinosis. In other words, in the opinion of many pathologists the existence of an endothelioma as a definite tumour type has never been completely proved].—J. R. M. INNES.

HOLZ. (1935). Ein Beitrag zu den sog. epidermoidalen Cholesteatomen des Pferdes. **[Epidermoid Cholesteatoma of the Horse].**—*Berl. tierärztl. Wschr.* **51.** 21-22. 4 figs. [9 refs.]

In a previous article [this *Bull.* **5.** 289.] the author described several cases of this type of tumour. This paper records a further case of cholesteatoma which occurred in the brain of a horse. The histological features are described. No new facts are presented.—J. R. M. INNES.

STUBBS, E. L., & FURTH, J. (1934). **Experimental Studies on Venereal Sarcoma of the Dog.**—*Amer. J. Path.* **10.** 275-286. 15 figs. on 2 plates, 1 chart. [14 refs.]

Venereal sarcomata of the dog occur as single or multiple nodular or papillary growths on the corona penis, or in the vaginal mucous membrane, and occasionally metastatic growths are encountered in the lymph nodes. It is noted that the tumour is readily transmitted by sexual contact and experimentally by rubbing tumour tissue into scarified mucous membrane, or by injecting pieces into the subcutaneous tissue. Often the tumour regresses spontaneously. The authors successfully transmitted two venereal sarcomata to healthy dogs, and one of them was transmitted through 11 successive generations : 72 per cent. of the dogs injected subcutaneously with suspensions of tumour cells developed sarcomata. Intravenous inoculation produced generalized sarcomatosis in two out of seven animals inoculated. Transmissibility of the tumour was lost after storage in 50 per cent. glycerin, after desiccation, after freezing and thawing, or after heating to 50°C. for one and a half hours. Filtrates also gave negative results. The experiments indicate that venereal sarcoma (infectious sarcoma of the dog) can be transmitted only by viable tumour cells, and is therefore a distinct neoplastic growth and not the result of multiplication of a virus or a bacterial agent.—D. R. WILSON.

I. DE KOCK, G. (1933). **A Symposium on Cancer. I. The Significance of the Study of Neoplasms in Animals.**—*S. Afr. med. J.* **7.** 817-820. [14 refs.]

II. MARAJEW, P. (1934). Teratoid des Ovariums beim Schwein. [**Teratoma of the Ovary in the Pig**].—*Arch. wiss. prakt. Tierheilk.* **67.** 271-276. 4 figs. [11 refs.]

I. A short paper in which it is rightly pointed out that there is little or no accurate information available regarding neoplastic diseases in domesticated animals. Brief paragraphs deal with the incidence, classification, significance of malignancy and aetiology. The author considers that data regarding incidence, types of tumours, organs and types of species affected would materially assist the knowledge regarding neoplasms in human beings.

II. Only three cases of a teratoma of the ovary in animals have apparently been described. The author reports a case of a tumour of this type in a five-month-old pig. The histological features are described in detail. The tumour was a true mixed growth ; connective tissue, fat, cartilage and glandular epithelium elements were present and therefore the neoplasm must have been of both endodermal and mesodermal origin.—J. R. M. INNES.

GUYOT, & BETHOUX. (1934). Hypocalcémie et calcithérapie en Cochinchine. [**Hypocalcaemic Conditions in Horses in Cochin-China**].—*Rev. vét. milit.* **18.** 401-411.

In certain provinces in Cochin-China, the soil is markedly deficient in minerals, and the horses of the French colonial army stationed in these areas suffer from hypocalcaemia, manifested in its acute form by parturient " eclampsia " and in its more chronic forms by various types of osteodystrophy. Up to the end of 1932, no form of treatment was found to be effective, but at that time the authors adopted the parenteral injection of calcium gluconate. It was found that the acute conditions of hypocalcaemia rapidly responded to this treatment, and that the repeated injection of calcium gluconate appeared to give encouraging results when adopted in the early phase of the osteodystrophic conditions. The authors now propose to proceed with their observations, using vitamin D alone and in conjunction with calcium gluconate.—J. RUSSELL GREIG.

PAPPENHEIMER, A. M., GOETTSCH, Marianne, & ALEXIEFF, Anna. (1934). **Nutritional Myopathy in Ducklings.**—*J. exp. Med.* **59.** 35-42. 3 figs. on 2 plates, 1 table, 1 chart. [10 refs.]

Ducklings fed on a simplified diet of skimmed milk powder, casein, cornstarch, lard, salts, cod liver oil, yeast and paper pulp, rapidly succumb to a disease characterized by degeneration of the skeletal muscles ; no other organs or tissues are affected. The changes in the skeletal muscles were due to hyaline or waxy degeneration of fibres, with oedema and cellular reaction of the intermuscular tissue ; the creatine content of the muscles was reduced. Control ducklings on a natural food remained healthy.

It had previously been shown that the same diet produced in chickens a disorder of the central nervous system. It is interesting to note that the same diet produces such diverse pathological changes in two different species of birds.

—R. F. GORDON.

RHOADS, C. P., & MILLER, D. K. (1933). **The Production in Dogs of Chronic Black Tongue with Anemia.**—*J. exp. Med.* **58.** 585-605. 6 text figs., 8 figs. (3 coloured) on 3 plates, 1 table. [23 refs.]

There is an apparent symptomatic similarity between pellagra in human

beings and black tongue in dogs and both may be due to diets deficient in vitamin B_2 or G. The same factor has been shown to be effective therapeutically in human sprue and also as a part of the complex therapeutic agent capable of causing remission in pernicious anaemia in man. It appears probable, therefore, that the lack of the same factor may play a role in the aetiology of the last two (sprue and pernicious anaemia). The authors give an account of experiments which were carried out to try and produce a condition which would be more like sprue and pernicious anaemia than acute black tongue, particular attention being paid to the blood findings. A review of the literature concerning the aetiology and experimental production of black tongue is given commencing from the experiments of CHITTENDEN (1907) when he showed that dogs deprived of meat and milk fell ill with symptoms including marked salivation, stomatitis and diarrhoea, which were similar to those of the disease known as Stuttgart in Europe and black tongue in America. Dogs were fed on white maize meal, peas, casein, cod liver oil, cotton seed oil, rice polishings, calcium carbonate and sodium chloride. In a number of cases a chronic disease developed in which a well defined anaemia was a well-marked feature. The symptoms are described in detail and cannot be gone into fully here, but are stressed as important since on their presence depends the similarity of the experimental condition produced to disease syndromes in human beings. They include chronic stomatitis with acute exacerbations, salivation, atrophic glossitis, loss of weight, diarrhoea and moderately severe anaemia, the findings of which were analogous to the macrocytic anaemias of sprue and pernicious anaemia in man. The exact aetiological factor still remains uncertain although the evidence points to vitamin B_2. The lesions in the bone-marrow were mainly those related to intense cellular activity, decrease in fat and replacement of the latter with young haematopoietic cells. These were also considered to be similar to those in sprue and pernicious anaemia.—J. R. M. INNES.

PUBLIC HEALTH.

—. (1934). Die Fleischbeschau und Kunde der sonstigen von Tieren stammenden Lebensmittel, die Milchkunde und Milchwirtschaft und die Ausbildung des Tierarztes in der Schlachtvieh- und Fleischbeschau sowie in der Lebensmittelüberwachung in der neuen Prüfungsordnung für Tierärtze. **[Reorganization of Veterinary Meat and Milk Inspection in Germany]**.—*Z. Fleisch- u. Milchhyg.* **45.** 61-62.

This paper refers to that part of the revised rules for the professional examination of veterinary student candidates dealing with meat inspection, which is being given greater attention than previously.—J. E.

TIRAFERRI, E. (1934). Ricerche sulla batteriemia in animali normali da macello. **[Bacillaemia in Normal Slaughter Animals]**.—*G. Batt. Immun.* **12.** 1039-1045. [13 refs.] [English, French and German summaries : abst. from orig.]

Blood cultures were prepared from 111 horses, 128 bovines, 131 sheep and 31 swine, when these animals were slaughtered for food purposes. None of the cultures from cattle or pigs contained bacteria, but organisms were isolated from the blood of five sheep and six horses. Haemolytic streptococci were the only organisms isolated of possible pathogenic significance.—E. J. PULLINGER.

WIEDMANN, F. (1934). Eiter in der Milch. [**Pus in Milk**].—*Z. Untersuch. Lebensmitt.* **67.** 174-178. [5 refs.]

The appearance and chemical properties of pus in milk are described. The cellular elements consist mainly of degenerated neutrophiles, erythrocytes and epithelial cells. Milk is examined for pus by centrifuging 10 c.c. in a centrifuge tube, which has a constricted base (Trommsdorf tube), for three minutes. Milk containing 1 volume of deposit per 1,000 volumes should be suspected of containing pus, whilst if the ratio is 2 : 1,000 the milk has certainly come from mastitis-infected cows. The test is improved if a pepsin-hydrochloric acid mixture is allowed to act upon the centrifuge deposit. In this way all free protein matter is digested and, if the mixture is then recentrifuged, the true cell content may be ascertained. —E. J. PULLINGER.

MOLANUS, B. H. (1934). Die sterilisatie door middel van katadyn en hare toepassingen in de vleesch- en melkhygiëne. [**Sterilization by Catadyne Action : Its Use in Meat and Milk Hygiene**].—*Tijdschr. Diergeneesk.* **61.** 225-234. [19 refs.]

Certain metals confer toxic action on water in contact – the so-called oligodynamic action of Naegeli. The author deals with the literature on catadyne, a special preparation of silver activated with gold, and states that catadyne has a high sterilizing power in water and inhibits multiplication of bacteria in milk and meat.—J. VAN DER HOEDEN (UTRECHT).

ALBRECHT, A. (1934). Bakterielle Erkrankungen des Menschen (sog. Fleisch-, Wurst-, Fischvergiftungen usw.) nach Genuss von Nahrungsmitteln tierischer Herkunft, ihre Beziehung zu Tierkrankheiten sowie Erkrankungen durch chemische Schadlichkeiten (ein Ueberblick nach neueren Forschungen und Beobachtungen). [**Bacterial Diseases of Man following Ingestion of Animal Tissue – A Review**].—*Münch. tierärztl. Wschr.* **85.** 485-491, 498-502, 509-513 and 521-527. [227 refs.]

These four articles constitute a summary of the present state of knowledge concerning the diseases of man known as meat, sausage and fish poisoning, together with some remarks on organic and chemical poisons in relation thereto. After a short general account, considerable space is devoted to the bacterial disease due to the paratyphoid-enteritidis group, viz. *Salmonella paratyphi* (formerly *Bact. paratyphosum*) A, B and C, *S. enteritidis* (formerly *Bact. enteritidis* Gärtner) and *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau). The clinical appearances, diagnosis, prognosis and accounts of outbreaks are discussed. Food poisoning from the ingestion of milk, cheese, eggs and fish is then passed in review. Outbreaks due to other bacteria in animal products, excluding botulism, are caused by streptococci, staphylococci, putrefactive organisms, *Bact. coli*, *Proteus vulgaris*, *Bact. morbificans* and *S. cholerae-suis* (formerly *Bact. suipestifer*).

Under the heading of prevention, the value of inspection of food animals before slaughter, hygienic slaughter, preparation and storing, systematic meat inspection and bacteriological examination of emergency slaughter cases, are emphasized. The various aspects of responsibility – individual, municipal and state – are discussed.—A. W. N. PILLERS.

VERGE, J. (1934). Les maladies infectieuses transmises à l'homme par les oeufs. [**Diseases transmitted to Man by Eggs. Review**].—*Rec. Méd. vét.* **110.** 705-723. 1 table. [106 refs.]

This review deals entirely with infectious diseases of man transmissible by

eggs. The first section deals with avian tuberculosis. According to some authors, avian tuberculosis may, under exceptional circumstances, be transmissible to man, particularly in certain cutaneous forms, but it is not an actual menace to public health. Although avian tuberculosis is fairly wide-spread, it appears as if avian tubercle bacilli are present in a small percentage only of the eggs of infected birds although, as a composite table shows, the percentage found varies, probably according to the technique used. It has been proposed that systematic tuberculin testing and marking of eggs from disease-free flocks would eliminate any slight danger to public health.

Another section, dealing with avian paratyphoid infection, points out that hens, pigeons, ducks, geese and turkeys may suffer from infection with members of the paratyphoid group, particularly *Salmonella typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) and *S. enteritidis* (formerly *Bact. enteritidis* Gärtner). Infection may be transmitted from the ovary of the infected bird to the egg, although there is also the possibility of contamination when eggs are left in a humid atmosphere in contact with infected material. Examination of the serum of birds by agglutination tests is the best method for the elimination of infected birds, a titre of 1 : 20 being sufficient to indicate infection. Subsequently, hygienic precautions and elimination of carrier birds may be carried out.

According to certain authors, *S. pullorum* and *S. gallinarum* may have some pathogenic effect on human beings, particularly infants, but if so the author considers it exceptional. Both bacillary white diarrhoea and fowl typhoid are transmissible through the egg, and the prophylactic measures are based on results of serological examinations.

Pasteurella organisms in eggs do not appear to play any part in human disease.

The control of diseases transmitted by eggs is considered to be largely a veterinary matter.—R. Lovell.

THERAPEUTICS.

I. Pearson, A. M., Wilson, J. L., & Richardson, C. H. (1933). **Some Methods used in Testing Cattle Fly Sprays.**—*J. econ. Ent.* **26.** 269-274. 1 fig., 1 table. [6 refs.]

II. Wilson, J. L., Pearson, A. M., & Cannon, Y. C. (1933). **The Effects of Some Fly Sprays on the Hides and on the Body Temperatures of Dairy Cows.**—*J. Dairy Sci.* **16.** 427-433. 1 fig., 1 table. [5 refs.]

I. The writers record details of some of the methods adopted in testing the repellent efficiency of cattle fly sprays against *Stomoxys calcitrans*. For instance, it was found desirable to determine the fly susceptibility of experimental cows before testing fly sprays. The normal fly susceptibility of each cow was obtained from the average of two counts of the numbers of flies present, made hourly from 7 a.m. till 3 p.m. for a period of three days. The cows were then divided into suitably balanced groups so that similar counts made after spraying could be compared with the normal fly counts. In determining the relative fly repellency it was found desirable to tether the cows separately in preference to permitting them to graze at liberty, as in the latter instance they frequently rubbed together and maintained a changing environment from a stand-point of fly population. Six repellents of unstated composition were used in the tests.

II. Twelve petroleum oils of varying viscosity, refinement and composition were sprayed at a rate of 2 oz. per cow daily for up to two months. Five oils gave visible evidences of causing skin injury, but two of these caused relatively slight

irritation. The first appearance of skin injury occurred after about 35 days' spraying and was characterized by an unusually large amount of loose hair.

A small but consistent rise in body temperature occurred after spraying and was most pronounced on the warmer days. Injury to the skin was especially marked on the areas most exposed to the sun's rays.

Harmful results particularly followed the use of electric sprayers, as the spray was delivered with considerable force, causing the oil to penetrate to the skin. FREEBORN, REGAN and BERRY [this *Bull.* **5.** 94.] suggest that direct contact of the oil with the skin is more likely to cause injury.—J. S. STEWARD.

KIRCH, J. (1935). Behandeling van huidziekten in gascellen. [**Treatment of Skin Diseases in Gas Chambers with Sulphur Dioxide**].—*Tijdschr. Diergeneesk.* **62.** 1-16. [English, French and German summaries: abst. from orig.]

In those areas where sarcoptic mange occurs frequently among cows, it is advisable to have gas chambers in which the animals can be treated with SO_2. The author treated three cows simultaneously in a well-isolated small shed, in which about 6 per cent. (by volume) of SO_2 was admitted from a cylinder. The heads of the animals outside the shed were treated separately with liniment. Though these cows were allowed to return to the contaminated stalls, no relapses occurred. The author explains this fact by the theory that the dead mites immunize the animals. The control of sarcoptic mange in cattle is also important from a medical point of view, as transmission from cattle to man is very easy.

—J. VAN DER HOEDEN (UTRECHT).

AGRONIK, M. A. (1934). **Treatment of Mange in the Horse.**—*Sovyet. Vet.* No. 11. pp. 71-76. [Abst. from French summary].

DEMIANOVITCH proposed the use of the following treatment of mange in horses (after successful use for human scabies) :– a friction with 60 per cent. solution of hyposulphite of soda, and 20 to 30 minutes later a friction with 10 per cent. solution of hydrochloric acid : repeat two or three times. According to the author and others, it is quite harmless for the patient and applicant ; no harm will be done by increasing the treatment to obtain a quick cure ; it is simple and available to all ; it does not erect or mat up the hairs, which are easily washed afterwards, and it is cheap and very effective.—C. V. WATKINS.

SOKOLA, D. (1934). Liječenje helmintijaze kid konja sa carboneum tetrachloratum. [**Carbon Tetrachloride as an Anthelmintic for Horses**].—*Jugoslov. vet. Glasn.* **14.** 45-49. 3 tables. [9 refs.] [Abst. from German summary].

The author reports good results with carbon tetrachloride by stomach tube against sclerostomes, ascarids and oxyurids of the horse, using a dose of 0·25 c.c. per kg., in milk, liquid paraffin or water Experimental doses of 0·5 c.c. per kg. did not cause any symptoms of poisoning..—J. E.

SEMENOWA, N. (1933). **Treatment of Trichuriasis by "Osarsol".**—*Med. Parasitol. Moscow.* **2.** 149-151. [German summary]. [Abst. from abst. in *Trop. Dis. Bull.* **31.** 803].

Good results in the treatment of human trichuriasis are claimed with a combined course of methylene blue (0·15 g. two to three times a day for two days) and "osarsol" (a Russian brand of "stovarsol") 0·75 g., rising to 1·5 g. daily during a four days' course.—J. E.

ASCHOFF, H. (1934). Versuche über die bakterizide Wirkung des Parachlorsols. **[The Bactericidal Action of " Parachlorsol "]**.—*Berl. tierärztl. Wschr.* **50.** 741-742.

The disinfectant properties of a para-chloro-cresol compound sold under the name of " parachlorsol " were tested. Chemically it is closely related to phenol and dissolves freely in water in all proportions, forming a water-clear solution which can be employed for general surgical purposes and the disinfection of instruments or the hands without any deleterious effects.—N. S. BARRON.

SEIT, B. (1934). Foreløbig Meddelelse om Behandling af Streptokok-Mastitis hos Koen med Entozon-Opløsning. **[Experience in the Treatment of Mastitis with " Entozon "]**.—*Maanedsskr. Dyrlaeg.* **46.** 257-264. 2 tables.

The author has treated 100 cows suffering from chronic streptococcus mastitis (diagnosed through microscopic examination of centrifuge sediment) with infusions of 0·75 : 1,000 " entozon " solution. The treatment was given during the dry period, by means of infusions of 500 to 1,000 c.c. of the solution, which was left in the udder for five to 15 minutes, the organ being massaged in order to distribute it throughout the gland. The effect of the treatment was controlled by means of clinical examinations of the milk and udder during the following lactation period, the result being that 92 of the cows yielded milk of normal microscopic appearance. In six treated cows, no streptococci were found on microscopic examination of the centrifuge sediment after the treatment had been repeated three times. Cultural examination was not carried out.—H. C. BENDIXEN (COPENHAGEN).

STECK, W. (1934). Ein Versuch der experimentellen Vergleichung verschiedener Akridinderivate als Galtbekämpfungsmittel. **[Comparative Therapeutic Trials with Acridine Derivatives in Streptococcus Mastitis]**.—*Schweiz. Arch. Tierheilk.* **76.** 559-569. 5 tables, 1 chart. [5 refs.]

In view of the difficulty of comparing the action of the various acridine dyes in the field, Steck set himself to study first their relative irritant effect in milking cows intended for slaughter, and secondly their relative bactericidal action *in vitro*. The irritant effect was tested by injecting 1,000 c.c. *via* the teat canal and leaving it there for 19 hours before stripping out, the criterion being the number of days which elapsed before the milk yield again reached its former level. Ten days was regarded as satisfactory. In most cases, two derivatives were also compared on quarters of the same cow which gave a similar yield and whose secretion was as far as possible alike in character.

The bactericidal activity was tested by mixing one part of the derivative under test, at various concentrations, with one to ten parts of slightly or markedly altered secretion.

" Trypaflavine ", 0·1 to 0·15 per 1,000, is regarded as the most suitable agent, and the results with the other acridine derivatives are therefore expressed in terms of " trypaflavine ". Thus, 0·1 per 1,000 " trypaflavine " has the same irritant effect as 0·2 per 1,000 " rivanol ", 0·4 per 1,000 " entozon " and 10 per 1,000 " uberasan " ; it has the same bactericidal effect as 1 per 1,000 " rivanol ", 2 per 1,000 " entozon " and 30 per 1,000 " uberasan ". Using concentrations of the various dyes of similar irritant effect, " trypaflavine " is, therefore, five times as active as " rivanol " or " entozon " and three times as active as " uberasan ".
—A. W. STABLEFORTH.

DRYERRE, H., & GREIG, J. R. (1935). Den specifike Kemoterapi for Kaelvningsfeber ved Hjaelp af parenteral Indgift af " Kalciumboroglukonat ". **[The**

Specific Chemotherapy of Milk Fever by the Parenteral Administration of Calcium Borogluconate].—*Medlemsbl. danske Dyrlaegeforen.* **18.** 109-117. [Translation in *Vet. Rec.* **15.** 456-459. Abst. from English translation].

It has been previously reported that cases of milk fever made a rapid, spectacular, curative response to the injection of calcium gluconate, given either intravenously or subcutaneously, provided that an adequate dose was administered. A number of veterinary practitioners, however, reported that, after subcutaneous injections, untoward complications such as subcutaneous oedema, abscess formation and even extensive necrosis developed at the site of injection. It was soon apparent that the subcutaneous injection of calcium gluconate at concentrations higher than 5 per cent. was undesirable and, in order to introduce safely the requisite dose of 2 oz., it was necessary to inject at least two pints of solution, too large a volume for convenience.

This article reports a method of preparing calcium borogluconate, which has been found to overcome the difficulties outlined above, as it can be obtained in 40 per cent. solutions and has been found to be as efficacious as calcium gluconate itself. A short description of the chemical nature of calcium borogluconate is given. The authors also discuss the comparative merits of the intravenous and subcutaneous routes of injection, and the advantages of calcium therapy over mammary inflation.—James Stewart.

Pirani, A. (1934). Contributo allo studio del trattamento anti-tripanosomico dei bovini. [**Treatment of Trypanosomiasis in Cattle**].—*Clin. vet., Milano.* **57.** 189-197.

Experiments were carried out on a series of calves to compare the value of " atoxyl " and tartar emetic in the treatment of bovine trypanosomiasis. It was found that 5 to 10 c.c. of a 10 per cent. solution of " atoxyl " has no specific action on *Tryp. abyssinicum* and that its general value is limited. Tartar emetic given intravenously has a rapid and dangerous action and must be used with caution ; 5 c.c. of a 10 per cent. solution causes lysis of the trypanosomes circulating in the blood. It will not prevent the development of the parasites which may become tolerant to the drug, but if given five or six times at 10-day intervals it is of some value.—J. A. Nicholson.

Rozier, & Jullien. (1934). Recherches sur l'action thérapeutique dans les leishmanioses canines du stibio-thio-propanol-sulfonate de sodium. [**Therapy of Canine Leishmaniasis with Sodium Stibio-Thio-Propanol-Sulphonate**].—*Bull. Sci. Pharmacol.* **41.** 149-152. [Abst. from abst. in *Rec. Méd. vét.* **110.** 626].

Good results in the treatment of canine leishmaniasis with sodium stibio-thio-propanol-sulphonate are reported, the dose being 2 cg. per kg. body weight intravenously in acute cases, and 5 mg. per kg. body weight in the chronic form. —J. E.

Ganslmayer, R. (1934). Ein Beitrag zur Wirkung des Coramins beim Hund. [**Action of " Coramine " on the Dog**].—*Vet. Arhiv.* **4.** 106-151. 23 figs., 1 table. [49 refs.] [In German].

A further contribution to the pharmacology of recently introduced drugs from the Pharmacological Department of the Veterinary School at Zagreb [see also this *Bull.* **2.** 671 and **4.** 586.] The action of " coramine ", which is a camphor preparation, was tested on 27 dogs, either primarily, or secondarily in animals already under the influence of the narcotics " pernocton " or avertin.

" Coramine " is a general stimulant and causes a deepening of the respiration and a rise in blood pressure, due to increased output of the heart. In overdoses, it causes muscular cramp, particularly affecting the muscles of the jaws.

In dogs under the influence of avertin or " pernocton ", " coramine " causes a recovery in the depressed respiratory and circulatory systems, but does not bring about a rapid restoration of consciousness.

Therapeutically, " coramine " is valuable as a restorative in conditions of deep depression or anaesthesia. It can be administered intravenously, but is best given in small repeated doses. Since the effects of an intravenous dose wear off so quickly, it is usually advisable to give an intramuscular dose at the same time.
—J. E.

VECTEN, & COSSON. (1934). Essai de traitement des plaies du cheval par les larves et les extraites de larves de " Lucilia sericata ". [**Treatment of Wounds in Horses with Larvae and Extracts of Larvae of** *Lucilia sericata*]. —*Bull. Acad. vét. Fr.* **7.** 352-357.

This is a case record of a large superficial wound on the forearm of a horse, which was treated by the application of live larvae of *L. sericata* and a dressing composed of an extract of them.

It is claimed that this treatment resulted in the rapid cleansing of the wound, with consequent quickening of the healing process.—J. E.

POISONS AND POISONING.

WIEMANN. (1934). Bleivergiftungen in Bönkhausen. [**Lead Poisoning in Bönkhausen**].—*Dtsch. tierarztl. Wschr.* **42.** 765-766. [2 refs.]

This is a description of an outbreak of lead poisoning which occurred in the small mountain village of Bönkhausen (Westphalia). Not only were the domestic animals and the poultry involved, but the inhabitants themselves were affected.

A tentative diagnosis of lead poisoning was made based upon the symptoms and history, but analysis of water samples did not support the diagnosis. It was subsequently discovered, however, that the soil was rich in lead compounds and that, when heavy rains occurred, the mud on the stream bed was churned up causing the water to become temporarily dangerous. The lead content at such times was 1·5 mg. of lead per litre. When the stream overflowed its banks, meadows also became contaminated and 500 g. of grass was discovered to contain 100 mg. of lead. The bones of a cow that was killed *in extremis* were found to contain 5 mg. per 200 g. Special precautions were immediately introduced for the regulation of the water supply to the whole village.—N. S. BARRON.

COSTANTINI, A. (1934). Sulla presenza di fluoro nel latte di animali intossicati sperimentalmente con fluoruro di sodio. [**On the Presence of Fluorine in the Milk of Animals Experimentally Poisoned with Sodium Fluoride**].—*Biochim. Terap. sper.* **21.** 337-342. [7 refs.]

In order to determine whether fluorine is excreted in the milk, two lactating goats were given daily 1·5 and 2 g. of sodium fluoride by stomach tube. After three or four days the animals began to lose condition rapidly and ceased to feed in about a week. During this period the milk yield declined considerably and changes were noted in the pH, specific gravity and fat content of the milk. Traces of sodium fluoride were demonstrated in the milk, the amount being estimated at 0·001 g. per 100 c.c. of milk. The author considers that this quantity is too small to be of any practical importance.—J. A. NICHOLSON.

MITCHELL, D. T., CANHAM, A. S., & BAYER, A. M. (1934). *Urginea Capitata* **Baker – the Berg Slangkop. Its Toxic Effect on Ruminants.**—*Onderstepoort J. vet. Sci.* **2.** 681-689. 1 fig., 2 tables. [2 refs.]

U. capitata is found in Natal mainly in the vicinity of the Drakensberg mountains. The plant was found to have been the cause of heavy mortality amongst cattle on a farm where it occurred. The chief symptom was the occurrence of a profuse diarrhoea, excessively bloodstained and sometimes resembling coagulated blood. *Post mortem*, an acute haemorrhagic enteritis was found, chiefly affecting the ileum. The toxic dose for an adult animal appears to be between 6 and 8 lb. A botanical survey of the farm showed the high incidence of the plant in the camps where the cattle developed symptoms.—E. M. ROBINSON.

OLSSON, E. (1934). Förgiftning med sandtrav (Arabis arenósa) hos häst. [**Poisoning of Horses by** *Arabis arenosa*].—*Svensk VetTidskr.* **39.** 311-316. 1 fig.

During May and June, 1934, the author recorded 20 cases of a peculiar locomotor disturbance in horses, which were known to have eaten *A. arenosa*, either as green food, or in hay, immediately before the attack. A short botanical description of the plant is given, with an account of its incidence. The attacks in horses come on very rapidly, usually within 24 hours after ingestion of the poisonous plant. The chief symptom is an acute lameness in all four legs, or in one or both hind legs, but never in the fore legs alone. The whole attitude and local symptoms have considerable resemblance to those of an acute laminitis, from which a differential diagnosis can only be made on account of the rapid recovery. Most animals recover within a few days when treated by bleeding and laxatives.

—GUSTAV NAERLAND (FARSUND).

RIMINGTON, C., & QUIN, J. I. (1934). **Studies on the Photosensitisation of Animals in South Africa. VII. The Nature of the Photosensitising Agent in Geeldikkop.**—*Onderstepoort J. vet. Sci.* **3.** 137-157. 14 figs. [14 refs.] [For absts. of previous articles of this series, see this *Bull.* **4.** 677].

With a view to identifying the photosensitizing agent in " geeldikkop " in sheep, the agent in cases of experimental biliary obstruction was studied and found to be a substance with the characteristics of a porphyrin. The photosensitizing agent in " geeldikkop " was found to be the same porphyrin identified as phylloerythrin. The methods used for the isolation and identification are described. Phylloerythrin is derived from chlorophyll in the food and when green food is withheld animals do not become photosensitive and phylloerythrin cannot be isolated from the bile, serum or faeces. The agencies responsible for the transformation of chlorophyll into phylloerythrin were not determined, but it is suggested that it results from protozoal or bacterial activity. The experiments so far carried out would explain all the symptoms seen in " geeldikkop " in sheep with the exception of the icterogenic factor which is still under investigation.—E. M. R.

ROBINSON, J. W., & BRANDENBURG, T. O. (1934). **Field Reports of Cattle Losses in North Dakota Due to Arrow Grass.**—*J. Amer. vet. med. Ass.* **85.** 458-459.

After a severe drought followed by excessive rain, numerous losses amongst cattle were reported. In the affected areas, the authors found a luxuriant growth of arrow grass, *Triglochin maritima*, which had been freely eaten by the cattle. This grass contains a cyanogenetic glucoside, and the symptoms shown by the affected animals and the *post-mortem* findings pointed to prussic acid poisoning. Under normal conditions, this grass is rarely eaten by cattle but, under the peculiar conditions in these cases, it was the only grass available in any quantity.—J. A. N.

SIAS, G., & MANNU, V. (1934). Il mal della ferula in Sardegna. [**Fennel Poisoning in Sardinia**].—*Clin. vet. Milano.* **57.** 919-933. [22 refs.]

Fennel is a common plant in the Mediterranean area, especially in Sardinia where it is responsible for causing losses amongst sheep, cattle and horses. In some regions, however, the plant is considered harmless and the authors wished to determine whether this is in fact the case. Plants were collected from these regions and also from regions where it is known to be poisonous. The juice was obtained by expression and watery and alcoholic extracts prepared. These preparations were given subcutaneously or *per os* to a series of sheep and such treatment was usually followed by death. When given *per os*, 5 kg. daily caused death in 15 days. During the last few days of feeding, the animal showed loss of appetite, decubitus and diarrhoea. On *post-mortem* examination, haemorrhages were found under the skin and in the intestine, and the mesentery was hyperaemic. The authors conclude that two types of fennel do not exist nor do climatic or geological conditions affect the toxicity of the plant. The active principle is cumulative, but drying renders it harmless. By repeatedly cutting the plant when in full leaf losses from this cause can be materially reduced.—J. A. NICHOLSON.

VAJDA, T. (1935). Vergiftung von Schweinen durch Chenopodiumöl und dessen unzuverlässige wurmtreibende Wirkung. [**Chenopodium Poisoning in Swine**].—*Wien. tierärztl. Mschr.* **22.** 142-145. [9 refs.]

Numerous cases of poisoning from the administration of oil of chenopodium to swine are quoted. The affected animals exhibit symptoms of excitement, convulsions and muscular spasms, with difficulty in moving; in some cases death follows.

Commercial oil of chenopodium appears to vary a good deal in its properties, some samples being very efficacious vermifuges, whilst others are very weak in this respect.—D. J. ANTHONY.

I. KOK, D. J., & VAN HARREVELD, A. (1934). Ueber Bulbocapnine-Intoxikation und Dummkoller des Pferdes. [**Bulbocapnine Poisoning and "Staggers" in Horses**].—*Dtsch. tierärztl. Wschr.* **42.** 813-816. 11 figs. [16 refs.]

II. KOK, D. J., & VAN HARREVELD, A. (1934). Over de acute bulbocapnine-vergiftiging van het paard. [**Acute Bulbocapnine Poisoning in a Horse**].—*Tijdschr. Diergeneesk.* **61.** 1032-1036. 5 figs. on 1 plate.

I. The symptoms produced by bulbocapnine, an alkaloid obtainable from *Corydalis cava*, vary according to the age and species of animal and the dosage used. Dogs and cats are particularly sensitive to the alkaloid and the authors have been struck with the similarity between symptoms seen in "staggers" in horses and the symptoms set up in these animals on the injection of medium doses of the alkaloid. An animal poisoned by small doses of bulbocapnine becomes motionless; equilibrium and capacity to react to stimuli remain, however, and there is no paralysis of motor nerves. This is well illustrated in cats for these animals will cling on to the back of a chair when in this condition. Larger doses produced an active resistance against movement; in such circumstances an animal will hold itself rigid and may be pushed about like a log. Still larger doses produce excitement, salivation, defaecation and the animal may become aggressive. Maximum doses produce epileptic convulsions and death. Since the symptoms seen in the first stage of poisoning are identical to those sometimes produced after the passage of an alternating current through the brain, it is probable that the alkaloid acts directly on the central nervous system.

II. The authors studied the action of bulbocapnine on a horse. For this purpose, a clinically sound animal was given 1,000 mg. intravenously, this being a dose of 4·5 mg. per kg. body weight. Shortly after the injection, slight involuntary movements were seen, but these soon stopped and the animal became motionless. The eyes were glassy and it was impossible to induce the animal to move forwards or backwards. On crossing or spreading out the fore limbs, no attempt was made to get into a correct position. The reaction to pain stimuli was much reduced, and firing a revolver close to the animal produced little effect. There was slight salivation, sweating, defaecation, extension of the penis and accelerated respiration. The symptoms slowly subsided 15 to 20 minutes after the injection and the animal became normal.—J. A. NICHOLSON.

KELLAWAY, C. H. (1934). **A Note on the Venom of the Sydney Funnel-Web Spider,** *Atrax robustus.—Med. J. Aust.* May 26th. 678-679. [1 ref.]

The bite of *Atrax robustus*, which causes serious and often fatal effects in man, was found to be quite innocuous for rabbits, guinea pigs and mice. In addition, venom extracted and dried *in vacuo* was also non-toxic when dissolved in distilled water and injected intravenously into a rabbit. It is suggested that these results may be due to one of the following facts :–

(1) the rabbit, guinea pig and mouse are insusceptible to the venom of the spider ; (2) the spider in captivity secretes a venom in less quantities and of lower potency ; (3) the symptoms seen in man are anaphylactic in nature, or (4) the symptoms produced are due to a potent toxin elaborated by bacteria which are not invariably present in the venom of the spider.—I. CLUNIES ROSS.

PHYSIOLOGY.

PETIT, M. (1934). Recherches sur la mastication chez le cheval. [**Research on Mastication in the Horse**].—*Rev. vét. Toulouse.* **86.** 657-686. 21 figs.

This article, which presents an original piece of work, is a critical review of the anatomy of all those portions of the head of the horse concerned in mastication. The structure and action of the temporo-maxillary articulation is considered in detail. The disposition of the molar teeth, their sphere of movement and method of use in the living subject are carefully analysed and described. The whole represents a valuable addition to knowledge on the subject of mastication in the horse. The article is well illustrated by a number of explanatory diagrams.—C. D.

CALHOUN, M. L. (1933). **The Microscopic Anatomy of the Digestive Tract of Gallus domesticus.**—*Iowa St. Coll. J. Sci.* **7.** 261-382. 39 plates, 2 tables. [210 refs.]

This is a lengthy description of the anatomy and histology of the alimentary tract of the domestic fowl and includes an extensive bibliography. Few new facts are presented, but the collection of data and the numerous plates illustrating the structure of the different parts should be of value to those workers who might wish to consult literature on this subject.—J. R. M. INNES.

MAYHEW, R. L. (1935). **The Hydrogen-Ion Concentration of the Digestive Tract of the Fowl.**—*J. Amer. vet. med. Ass.* **86.** 148-152. 2 tables. [6 refs.]

Determinations were made on 24 birds on material taken from the crop, proventriculus, duodenum and two other regions of the small intestine, the caeca and from the bile. The findings showed the digestive tract to be fairly acid, averaging

approximately pH 5 in the crop and decreasing to neutral point in the caeca. Considerable variation was found in the crop and proventriculus. The pH of the gizzard could not be determined because the appropriate indicators were not available, but it seemed to be just above 2·8.—W. J. IRONSIDE.

RIMINGTON, C. (1934). **Recent Advances in the Chemistry of the *Plasma Proteins* and their Complexes.**—*Onderstepoort J. vet. Sci.* **3.** 161-189. 6 figs. [109 refs.]

This is a review and, as stated in the introduction, the author confines himself to certain aspects of the subject only – the modern conception of the individual indentities and interrelationships of the serum proteins apart from fibrinogen. Recent advances in the chemistry of the complexes which these proteins are known to form with lipoid and carbohydrate materials are discussed. Commencing with the proteins of the serum, the author goes on to discuss the albumin and globulin fractions, the behaviour of the serum lipoids and, finally, the " bound sugar " of the blood and protein carbohydrate complexes, to the study of which he has himself contributed.—E. M. ROBINSON.

CURSON, H. H., & MARÉ, G. S. (1934). **Studies in Sex Physiology No. 12. The Situation of the Developing Foetus and the Relationship between the Pregnant Horn and the corresponding Corpus Luteum Verum.**—*Onderstepoort J. vet. Sci.* **3.** 477-483. 8 figs., 1 table. [2 refs.]

This article is an addendum to previous papers – studies 10 and 11 [this *Bull.* **5.** 158 and 459]. Out of seven cases, five showed cranial presentation, four showed the dorso-sacral position and three the dorso-iliac. In all seven cases the foetus was situated in the horn corresponding with the ovary from which the ovum in question arose.—E. M. ROBINSON.

COHRS, P. (1934). Eineiige Zwillinge bei Schaf und Schwein und zweieiige, aber monofollikuläre Zwillinge beim Schaf. **[Uni-Ovular Twins in Sheep and Swine and Bi-Ovular but Monofollicular Twins in the Sheep].**—*Berl. tierärztl. Wschr.* **50.** 641-645. 5 figs. [31 refs.]

The author records two cases in which careful examination has enabled a certain diagnosis to be made of uni-ovular twins. In one case, the right uterine horn of a ewe contained two embryos although only one corpus luteum of pregnancy was present in the ovaries. The embryos were lying close together in a single chorion and were of the same sex and identical in appearance. The allantois was divided and each embryo lay in a separate amnion. There was a close anastomosis of the foetal vessels. A similar case was seen in a sow, where 12 embryos were present yet the ovaries contained only eleven corpora lutea. Two of the embryos were enclosed in a single chorion and were identical. Here also a close anastomosis of the foetal vessels existed. A case of dizygote twins in a sheep is also described. Here, two embryos had developed in separate uterine horns although only one corpus luteum was present in the ovaries. The foetal membranes were separate and there was no anastomosis of the blood vessels.—J. A. NICHOLSON.

STÅLFORS, H., & HOFLUND, S. (1934). Nyare metoder, i främsta rummet hormonala, för graviditetsdiagnosen. **[New Methods of Hormonal Diagnosis of Pregnancy].**—*Svensk VetTidskr.* **39.** 107-113 and 140-156. 5 figs., 3 tables.

After a review of the different methods for the diagnosis of pregnancy at an early age by means of biological tests, the authors conclude that the original Aschheim-Zondeck reaction is of little value for diagnosis in animals and have,

therefore, carried out further experiments with the ovarian hormone, oestrin, either as it occurs in blood serum or in urine. Altogether, the authors have tested blood samples from 197 served mares, 144 of which remained under observation: 139 cases were correctly diagnosed. Samples of urine from 13 served mares were also tested. In five of these cases the diagnosis could be verified and was correct. Three samples of blood and one of urine from barren mares suffering from pyometra all gave negative reactions. Using serum, both pituitary and ovarian hormones were found to be present and a double test is therefore possible. Four samples of blood and three both of blood and urine from cases of nymphomania in mares were tested. Four of them showed a slight positive reaction. The suggestion is therefore made that the prognosis of ovariotomy in such cases might be more reliable when based upon such a test. [Not all of them are caused by ovarian dysfunction].

Samples of urine from 12 served cows were also examined. As a rule, ovarian hormone was not demonstrable until after the fifth month of pregnancy. The examination of the vaginal secretions in determining pregnancy, as recommended by KUROSAVAS, has been tried by DANELIUS with good results. A publication of this will appear within a short time.—GUSTAV NAERLAND (FARSUND).

REES, J. L. (1934). **Feeding of Sheep with a Protein-Rich Supplement.**—*Aust. vet. J.* **10.** 51-56. 4 tables, 2 graphs.

In Australia, it is usual for sheep to subsist for the greater part of the year on pasture which has matured and dried off, and it is considered that the modern heavy wool-producing sheep cannot obtain an adequate amount of protein from such pasture. The author conducted two large-scale field experiments, allowing sheep to partake at will of a protein-rich food in addition to the natural pasture. In both experiments the sheep receiving the supplementary food showed a significant increase in wool production as compared with controls, the increase (5·9 and 13 per cent.) being sufficient to pay for the cost of the supplementary feeding and show a profit for the pastoralist.—W. I. B. BEVERIDGE.

BERTRAND, G., & NAKAMURA, H. (1934). Recherches sur l'importance physiologique du nickel et du cobalt. [**Physiological Importance of Nickel and Cobalt**].—*Ann. Inst. Pasteur.* **53.** 371-378. 2 tables, 4 charts. [13 refs.]

Although it has long been known that traces of cobalt and nickel are present in the animal organism, little is known concerning whether they play any significant physiological role, or whether they are merely present as impurities. The experiments described in this article were designed to show if these elements were of any importance in the diet. The authors conclude that rabbits which had 0·0025 g. of nickel chloride and 0·001 g. of cobalt sulphate added to their diet showed a greater increase in weight and survived longer than a control group fed on the same diet, but cobalt and nickel free.—JAMES STEWART.

HAMERSMA, P. J. (1934). **Chemical Blood Studies. VI. A Serial Study over a 12 Month Period of Some Organic Constituents in "Laked" and "Unlaked" Blood Filtrates of Healthy Sheep (Merino) of Various Ages.**—*Onderstepoort J. vet. Sci.* **2.** 153-228. 80 tables, 4 graphs. [44 refs.]

The experiments described in this article were undertaken with the idea of getting figures for the organic constituents of the blood of the sheep under South African conditions as a basis for the study of pathological conditions. The following constituents were determined:—haemoglobin, sugar, total-nitrogen, non-protein nitrogen, urea nitrogen, total creatinine nitrogen, uric acid nitrogen and amino-acid nitrogen. The blood sugar content was found to be lower than

that found elsewhere, and a striking observation is the lowness of the non-protein nitrogen. The observations were made on 23 sheep, 20 of which were adult, and three lambs. The former were observed for 15 months and the latter for 11 months.—E. M. ROBINSON.

MISCELLANEOUS.

—. (1935). Oesterreich. Verordnung des Bundesministers für Land- und Forstwirtschaft im Einvernehmen mit den beteiligten Bundesministern zur Aenderung der Ministerialverordnung vom 15 Oktober, 1909 zum Gesetz vom 6 August 1909 und 26 Oktober 1934 über die Abwehr und Tilgung von Tierseuchen. [**Austria : Amendment of the Laws of 1909 and 1934 on the Control of Animal Diseases**].—*Reichsgesundheitsblatt.* **10.** 101-104. [2 refs.]

These amendments are really enlargements of the rules contained in the Order issued in 1909 and the Law of 1934. The most important are the following :–

Animals unaccompanied by a veterinary certificate will not be admitted to any market or be allowed the right of transport.

Special exemption from rules regarding veterinary examination is granted in the case of animals the property of the army or police, and in the case of racehorses and circus animals.—F. BULLOCK.

CLAUDE, A., & DURAN-REYNALS, F. (1934). **On the Existence of a Factor Increasing Tissue Permeability in Organs other than Testicle.**—*J. exp. Med.* **60.** 457-462. 2 tables. [13 refs.]

Extracts of various body organs and tissues of laboratory animals were tested for a capacity to increase tissue permeability like that of testicular extract [see this *Bull.* **2.** 529]. Some organs, notably spleen, lung and kidney, were found to possess this power, but to a less extent than testicle.—J. E.

WOOD, E. (1934). **A Review of Historic Veterinary Books.**—*J. Amer. vet. med. Ass.* **84.** 102-111.

The author suggests the compilation of a list of veterinary incunabula. Following Sir F. SMITH, he gives the *Artis veterinariae libri quattuor* of VEGETIUS as the first printed book dealing entirely with veterinary medicine, but it is now known that the work of VEGETIUS was not the first veterinary book to be printed, and that it was not an original work, being taken largely from the *Mulomedicina Chironis* written about 400 A.D. VEGETIUS' work cannot in any case be classed among the incunabula, as it was not printed until 1528.

The article, which ends with the mention of BLUNDEVILLE (died 1605) and MARKHAM (died 1637), is based on SMITH's " History of Veterinary Literature ", Vol. 1, which is now out of print.—F. BULLOCK.

HÖKL, J., & PETROV, G. (1934). Pneumatické stahování kůže vetsích zvířat a skubání drubeze. [**Pneumatic Skinning of Large Animals and Plucking of Poultry**].—*Zverolék. Rozpravy.* **8.** 180-184. [2 refs.] [Abst. from German summary].

The authors found that the pumping of air under the skin of horses, dogs, goats and fowls did not assist in skinning or plucking.—J. E.

BOLZ, W. (1935). Ein Beitrag zur Röntgendiagnostik und Heilung der Hufbeinbrüche. [**X-Ray Diagnosis and Treatment of Hoof Fractures**].—*Arch. wiss. prakt. Tierheilk.* **68.** 409-417. 7 figs. [14 refs.]

The commonest type of fracture of the os pedis runs in a sagittal fashion from the articular surface, along the dorsal and ventral surfaces, to the point of the toe. Other types of fracture include splitting off of portions of the tip of the toe by cracks running across from side to side and splitting off of either wing or of the pyramid process.

X-ray examination is of great assistance in differentiating fractures from conditions such as ossification of cartilage or pododermatitis. Photographs taken from two aspects are generally sufficient for making a diagnosis. The dorsal (or anterior) aspect reveals any sagittal fracture, or fracture across the point of the toe ; it may also give some guide to the situation of a fracture of a wing or the pyramid process. A lateral view reveals the presence of a fracture in either of the latter two situations. In addition to the above, a ventral view may show up fractures, particularly of the wings. When taking a photograph the digit should be fully extended so that the anterior aspect of the phalanges form a straight line. In this manner the pastern is removed out of the way of the apparatus ; whilst the extension of the limb tends to open the fracture and so make it more obvious.

The question of healing of fractures is discussed.—E. J. PULLINGER.

OFFICIAL AND OTHER REPORTS.

GREAT BRITAIN. (1934). **Statistical and General Report, Army Veterinary Services 1933-1934.** [TAPLEY, J. B.] pp. 24. 11 tables. London : War Office. [8vo].

This report opens with a statement of the strength of the British Army in horses (12,992) and mules (328) during the year under review. Then follow tables of admissions for treatment, incidence of certain diseases compared with the preceding year, efficiency and wastage and the effect of age on the same. There are also similar reports referring to army animals in Egypt.

The annual report of the Army Veterinary School at Aldershot is included in the pamphlet. A short account is given of the courses of instruction held and the work of the school laboratory. The report of the radiological department calls for special notice though it is disappointingly brief. The instructional and productive work carried out by the School of Farriery is also given.—C. DAVENPORT.

TANGANYIKA TERRITORY. (1934). **Annual Report of the Department of Veterinary Science and Animal Husbandry, 1933.** [HORNBY, H. E.] pp. 111. Dar es Salaam : Govt. Printer. [fcp] [4s.]

This report is submitted under the following five main headings :– Part I – Staff and General ; Part II – Disease Control ; Part III – Report on the Routine and Pathological Work of the Veterinary Laboratory, Mpwapwa ; Part IV – Mpwapwa Laboratory, Animal Husbandry Research ; Part V – Animal Husbandry in General, and Livestock Trade.

STAFF AND GENERAL.

Owing to depressed financial conditions, one Senior Veterinary Officer and two Stock Inspectors were retrenched during the year. There now remain only 15 veterinarians, compared with 21 in 1928. The greater use of trained native personnel, particularly in the laboratory, is to a limited extent helping to compensate for the reduction of European staff.

FINANCE.

The expenditure of the department amounted to £44,759 and there was a revenue from dipping fees, inoculations, sale of biological products manufactured and minor items amounting to £11,608.

Each of the sections is dealt with separately in this *Bulletin*.—S. A. EVANS.

TANGANYIKA TERRITORY. (1934). **Disease Control.** [LOWE, H. J.]—*Ann. Rep. Dept. Vet. Sci. & Anim. Husb., 1933.* pp. 3-15. 4 tables.

RINDERPEST.—The methods of control outlined in Part II of last year's report were continued with success during 1933. The main points of this policy were :– (a) strict quarantine of affected herds ; (b) double-inoculation of all infected and immediately in-contact herds, and (c) release of quarantine within a few weeks of the completion of the inoculations. Vaccination was used in dealing with the Ankole cattle of Bukoba, as these animals have an exceptionally low resistance compared with the zebu and are not sufficiently protected by serum alone.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA.—Control measures consisted mainly of strict quarantine of affected herds. A limited number of experimental vaccinations were carried out by the Veterinary Officer of the area in collaboration with the Veterinary Research Officer, using a Kabete (Kenya) culture vaccine, but results were inconclusive.

EAST COAST FEVER.—This disease still constitutes a most intricate problem, the whole of which urgently requires fuller investigation. Financial stringency precludes expansion of dipping operations and there is a total of only 20 government supervised tanks in the whole Territory.

TRYPANOSOMIASIS AND TSETSE FLY.—Infection of cattle in varying degrees was reported from practically every district in the Territory where livestock exist. The ever-increasing knowledge gained and made available by the Tsetse Research Department is being utilized by the government in many reclamation schemes. The Tsetse Research Department is in close co-operation with the medical and veterinary departments on this subject.

ANTHRAX AND BLACKLEG.—These diseases occur more or less sporadically. Prophylactic measures are adopted only in occasional outbreaks, where mortality is serious, using Kabete vaccines.

TUBERCULOSIS.—Evidence is accumulating which suggests that bovine tuberculosis is rare in the areas of low rainfall, but more prevalent than heretofore suspected in the moister areas.

HEARTWATER.—Evidence of this disease, both in cattle and sheep, has been confirmed, but its importance has not yet been assessed.

RABIES.—This disease has not yet been definitely confirmed in the Territory.

OTHER DISEASES.—There are short notes on several other diseases of minor importance, affecting domesticated animals in general.

MEAT INSPECTION.

Data compiled from the records of 22 government-maintained abattoirs are given. *Cysticercus bovis* infection accounted for the condemnation of 4 per cent. of carcasses and is by far the most prevalent of the disease conditions communicable to human beings.—S. A. EVANS.

TANGANYIKA TERRITORY. (1934). **Report on the Routine and Pathological Work of the Veterinary Laboratory, Mpwapwa.** [EVANS, S. A.]—*Ann. Rep. Dept. Vet. Sci. & Anim. Husb., 1933.* pp. 16-48. 14 tables.

STAFF.—The Acting Veterinary Pathologist and the Biochemist were on

leave during part of the year and the Veterinary Research Officer was on field duty for more than half the year.

Trained native personnel, who can undertake a considerable amount of tedious routine, are ably assisting in compensating for reduced European staff.

ANTI-RINDERPEST SERUM PRODUCTION.—All field requirements were met with an output of 49,930 doses, each of 40 c.c.

ANTI-RINDERPEST VACCINE PRODUCTION.—41,195 doses were issued for field use, the average dose being 10 c.c.

RESEARCH.—There are short notes on a few of the more important diseases encountered during the general routine of the laboratory; these are mainly of local interest.

[Special reports on Trypanosomiasis Research; Pathogenicity of *Tryp. theileri*; Rinderpest in Wildebeeste, and Variations of Serum Protein Fractions during an attack of Rinderpest have been abstracted separately, see pp. 478, 481, 485 and 486].—S. A. EVANS.

TANGANYIKA TERRITORY. (1934). **Mpwapwa Laboratory: Animal Husbandry Research. Animal Nutrition Research.** [FRENCH, M. H.]—*Ann. Rep. Dept. Vet. Sci. & Anim. Husb., 1933.* pp. 49-103. 38 tables. [6 refs.]

This contains detailed information on the nutritive value of certain grasses, a short report on the feeding of minerals to native oxen, a phosphorus survey of the grazing foliage of different parts of the Territory, data on the blood changes during parturition in cattle and a sub-section on pasture research [STAPLES, R. R.]

THE FEEDING OF MINERALS TO NATIVE OXEN.—The feeding of 2 oz. bone meal and ½ oz. of salt per head per day to young native oxen running under conditions characteristic of the Central Province did not result in increased rates of growth, though it did increase the organic phosphorus of the blood. However, the amount normally present (4·5 to 5 mg. P per 100 c.c. blood) was sufficient to allow of normal rates of growth.

PHOSPHORUS SUFFICIENCY SURVEY OF 1933.—The organic blood phosphorus of the stock was taken as a measure of the P sufficiency of the pasturage. Blood was examined from all types of stock, and the places visited included the coastal belt, the dry central plateau and the shores of Lake Victoria, together with high rainfall mountain grassland areas. Comparisons were also made of zebu and Ankole stock and the crosses of the two, when grazing in the same district. The conditions under which the stock was kept varied from stall feeding to those of the grossly overstocked and overgrazed areas.

The general conclusion reached was that where the stock get adequate grazing or receive supplementary feeding there was no lack of phosphorus. Shortage of protein and, above all, an absolute lack of food are more important at the present than any possible phosphorus deficiency.

BLOOD CHANGES DURING PARTURITION.—Only two cows were examined, but the results indicated that the protein fractions vary considerably in the periods just before and just after calving. Inorganic phosphorus fell, but organic phosphorus rose about the time of parturition. Calcium showed a marked fall, but the sugar content rose at calving. The pH, non-protein nitrogen, and chloride contents did not appear to be affected.

PASTURE SURVEY OF TANGANYIKA.—The important cattle district of Mbulu in the Northern Province and the neighbouring areas of fine grassland pastures of Karato and the Ngorongoro Crater are dealt with in detail. The notes constitute the second in a series of a pasture survey of the Territory.

The stock, climatic and soil conditions and vegetation are described and the important grassland species listed, while suggestions for the conservation and improvement of the pastures are also made. The Ngorongoro Crater is of particular interest in that it has apparently successfully carried for hundreds of years an enormous concentration of game animals and Masai cattle : its continuous high carrying capacity is apparently largely due to the seasonal nature of the grazing which allows of annual resting for a part of the year.—S. A. EVANS.

UGANDA PROTECTORATE. (1934). **Annual Report of the Veterinary Department for the Year ended December 31st, 1933.** [POULTON, W. F.] pp. 55. 19 tables, 1 chart, 2 maps. Entebbe : Govt. Printer. [fcp] [3s.]

This report is divided into sections dealing with disease control, field research, glossina investigation and reclamation, education, animal husbandry, hides and skins, stock farms, ghee, butter and meat and milk supplies. It includes, as appendixes, the reports of the veterinary pathologist and the educational officer, and reports by individual officers on rinderpest in game and meat inspection in native markets. It also contains maps showing the rinderpest and tsetse fly areas.

DISEASE CONTROL.

RINDERPEST.—Outbreaks mainly occurred in the south-west and south-east, and were dealt with by immunization by the double inoculation method, and by quarantine measures. During the year 77,508 cattle were immunized, with an adult mortality of about 12·5 per cent. The report states :–

> " Although the direct losses from rinderpest have not been large in proportion to the two million head in Uganda (it is doubtful if the total mortality figure exceeds 15,000), it has to be remembered that abortion and temporary sterility are common sequelae to inoculation and they cannot be avoided because the disease has to be met by immunisation wherever and whenever it appears and thus no selection of time and place or refusal of unsuitable cattle can be made.
>
> " The mortality in Ankole from inoculation of adults was approximately 11·85 per cent., which was a satisfactory figure in view of the fact that grazing was scanty, many herds showed signs of early infection prior to inoculation and in others trypanosomiasis was recorded."

The mortality returns include all deaths that occur during the five weeks' segregation subsequent to inoculation, though such deaths may be due to East Coast fever or trypanosomiasis or other causes.

TRYPANOSOMIASIS.—The most common trypanosomes encountered in Uganda are *T. congolense* and *T. vivax*. On requests for treatment, antimony potassium tartrate is administered intravenously after blood examination, if treatment is practicable. " Antimosan " was tried as a prophylactic in a herd of working oxen, weekly injections being given for some months, followed by fortnightly injections. The treatment did not prevent infection but the animals maintained excellent health and it is thought that such animals can be kept in working condition for considerable periods.

ANTHRAX AND CONTAGIOUS BOVINE PLEURO-PNEUMONIA.—Only three outbreaks of anthrax and one of contagious bovine pleuro-pneumonia are recorded.

BOVINE TUBERCULOSIS.—An investigation as to the prevalence of this disease is of particular interest in view of the relative freedom of most African territories. *Post-mortem* examination revealed an infection rate of 12·5 per cent. in long-horned cattle and 3·5 per cent. in zebu cattle. The double intradermal tuberculin test revealed an infection as high as 45·2 per cent. in one Ankole herd. Microscopic examination of 100 milk samples failed to reveal any infection of the milk.

GLOSSINA RECLAMATION.

Work was continued during the year on the reclamation of the *G. morsitans*

area of South Ankole, further clearings being undertaken at localized "fly" concentrations, and controlled grass burning was continued. The report states that

"the general picture at the end of the year indicated future final success especially in the Masha sector and the results of the past three years' burning became increasingly obvious, for there was a distinct thinning of acacias, especially the hebecladoides, many of which showed marked ill health. . . ."

EDUCATION.

"The aim of departmental education is to reach the mass of the stock owners, which, in effect, includes nearly all natives in the Protectorate and after obtaining their confidence to persuade them to help freely in disease control and to use their animals to an increasing beneficial degree in both a health and an economic sense."

Trained African assistants are considered an important link between the European and the more backward peoples. The more highly trained group of these assistants are given a three years' course of study at the laboratory. Courses of instruction in meat inspection have been instituted for native market masters, and a series of lectures on animal management have been arranged for native school masters.

FIELD RESEARCH.

Under this heading is chronicled the capture of *Tabanus regnaulti*, the first specimen obtained outside West Africa, and the therapeutic treatment of anaplasmosis [see this *Bull.* **4.** 715].

ANIMAL HUSBANDRY.

This section deals with work intended to improve native stock and to encourage a fuller exploitation of their economic value. During the year, 45,997 bulls were castrated, and attempts were made to introduce the use of pack bullocks. The shade drying of hides and skins was encouraged, and organizations developed for the production of ghee and butter. Trade routes were developed for the supervised movement of slaughter cattle to the main centres, and 41,983 cattle and 40,192 sheep were passed safely to their destinations. Records of *Cysticercus bovis* infection of slaughter cattle showed an infestation as high as 26 per cent. from one district whilst the lowest record is 2·3 per cent. Fluke infestation varied from 48 per cent. to 1 per cent.

Five stock farms are maintained, mainly to facilitate a study of native stock, and at one of these a herd of Ayrshire cattle is under observation. Experimental cross-breeding between the various native races, and between these and the Ayrshire animals is in progress. Amongst native breeds, the Kigezi cattle have proved the most satisfactory milk breed, producing an average yield of 5 lb. of milk per day over a period of six months, with a butter fat content of 4·65 per cent.

—U. F. RICHARDSON.

UGANDA PROTECTORATE. (1934). **Annual Report 1933, of the Veterinary Pathologist, Entebbe.** [METTAM, R. W. M.]—*Ann. Rep. Vet. Dept. 1933.* pp. 29-45.

The report of the veterinary pathologist includes work on rinderpest, trypanosomiasis and East Coast fever which will be abstracted separately in this *Bulletin* and, in addition, the preliminary investigations on the local strains, human and bovine, of *Mycobact. tuberculosis.* The early work indicates that typical human and bovine strains are involved. A disease of swine, associated with extensive diphtheritic deposits along the mucous membrane of the small intestine, was under investigation, and was found to be readily conveyed by the feeding of infected viscera, but not by the subinoculation of blood.

A small number of agglutination tests was undertaken to ascertain the prevalence of bovine contagious abortion, but no positive results were obtained.

A record of ecto and endo-parasites, sent for indentification, reveals the collection of new species of *Rhipicephalus* and *Haemaphysalis*, and an investigation of plants from the laboratory paddocks resulted in the detection of four poisonous species.—U. F. RICHARDSON.

INDIA, HYDERABAD-DECCAN. (1934). **Annual Report of the Stud and Veterinary Department of H.E.H. the Nizam's Government, for the Year 1932-33.** [BADAMI, B. K.] pp. 35. 4 figs. on 1 plate, 17 tables, 2 graphs. Hyderabad-Deccan : Govt. Central Press. [fcp].

The senior technical staff consisted of one Director, five Deputy Superintendents and one Veterinary Investigation Officer.

An investigation was undertaken to fix the correct dose of serum for serum-simultaneous inoculation against rinderpest for the different breeds of cattle in the State.

Tuberculosis was detected among the cattle at the Government Cattle Breeding Depot, Himayatsagar. Investigations into nasal granuloma in cattle and liver fluke were conducted. Nutritional deficiency disease was noted in cattle and further work in this connection is in progress. Mortality from bovine surra is reported.

The number of animals treated during the year at the veterinary hospitals and dispensaries showed a considerable increase, and the mortality from contagious diseases in the district slightly exceeded that of the previous year. Rinderpest caused the greatest number of deaths.

There were 35 stallions at the Hingoli stud and in the districts during the year.

A flock of Bikaneer sheep is being maintained as an experiment and a good report has been made on the quality of the wool obtained.—G. K. WALKER.

INDIA. (1934). **Annual Report of the Director of the Pasteur Institute of Southern India, Coonoor, for the Year ending 31st December, 1933, together with the Twenty-Seventh Annual Report of the Central Committee of the Association for the Year ending 31st March, 1934.** [IYENGAR, K. R. K.] pp. 78. 46 tables. Madras : The Madras Publishing House Ltd. [8vo].

Most of the report concerns the immunization of human beings bitten by rabid animals and is not here dealt with. The Paris fixed virus was in use throughout the year for the preparation of the vaccine, and at the close of the year was in its 912th passage. Semple's carbolized 5 per cent. sheep vaccine was in use throughout the year.

PROPHYLACTIC TREATMENT OF ANIMALS.—22,550 c.c. of antirabic vaccine was issued for the treatment of 335 animals, 291 of which were dogs that had been bitten by, or had come in contact with, rabid animals. Animals of 13 different species were dealt with. In the years 1923 to 1933, 1,836 animals had been treated with the vaccine, with a mortality from rabies of 3·8 per cent.

Brains from 298 animals suspected of being affected with rabies were examined during the year. It is considered that there must have been many more cases in the south of India than are indicated by this figure.

Table 9 gives data of animals that had bitten, scratched or licked human patients treated at the Institute. Thirty-one species of animals occur in the list.

—G. K. WALKER.